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DRINKING WATER SURVEILLANCE PROGRAM

BARRIE WELL SUPPLY

ANNUAL REPORT 1990

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BARRIE WELL SUPPLY

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1990

**HAZARDOUS CONTAMINANTS
COORDINATION BRANCH
135 ST. CLAIR AVENUE WEST
TORONTO, ONTARIO M4V 1P5**

SEPTEMBER 1992



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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

BARRIE WELL SUPPLY 1990 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

The Barrie Well Supply is a groundwater source containing numerous wells in several aquifers. The only treatment provided is the addition of sodium silicate for iron sequestering and chlorine for disinfection. The combined system has a maximum pumping capacity of $67.58 \times 1000 \text{ m}^3/\text{day}$. The Barrie well supply serves a population of approximately 55,000.

Three wells were chosen as representative of the system. Raw water from these wells and treated water from three locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall.

Table A (one for each well) is a summary of all results by group.

No known health related guidelines were exceeded.

The Barrie well supply, as sampled by DWSP, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW 1			SITE 1		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	36	1	2	12	4	33
CHEMISTRY (FLD)	24	24	100	109	70	64
CHEMISTRY (LAB)	264	208	78	456	399	87
METALS	288	80	27	552	234	42
CHLOROAROMATICS	140	0	0	140	0	0
CHLOROPHENOLS	12	0	0	.	.	.
PAH	185	0	0	17	0	0
PESTICIDES & PCB	368	0	0	213	0	0
PHENOLICS	12	0	0	.	.	.
SPECIFIC PESTICIDES	63	0	0	10	0	0
VOLATILES	348	0	0	348	21	6
TOTAL	1740	313		1857	728	

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW 2			SITE 1		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	36	0	0	12	4	33
CHEMISTRY (FLD)	27	27	100	107	88	82
CHEMISTRY (LAB)	264	198	75	456	371	81
METALS	288	101	35	552	264	47
CHLOROAROMATICS	140	0	0	154	0	0
CHLOROPHENOLS	12	0	0	.	.	.
PAH	185	0	0	17	0	0
PESTICIDES & PCB	368	0	0	234	0	0
PHENOLICS	12	0	0	.	.	.
SPECIFIC PESTICIDES	63	0	0	11	0	0
VOLATILES	348	0	0	348	10	2
TOTAL	1743	326		1891	737	

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW 3			SITE 1		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	36	0	0	8	1	12
CHEMISTRY (FLD)	24	24	100	78	62	79
CHEMISTRY (LAB)	264	178	67	304	239	78
METALS	288	80	27	368	151	41
CHLOROAROMATICS	168	0	0	70	0	0
CHLOROPHENOLS	12	0	0	.	.	.
PAH	185	0	0	17	0	0
PESTICIDES & PCB	397	0	0	107	0	0
PHENOLICS	11	0	0	.	.	.
SPECIFIC PESTICIDES	64	0	0	5	0	0
VOLATILES	348	0	0	232	24	10
TOTAL	1797	282		1189	477	

DRINKING WATER SURVEILLANCE PROGRAM

BARRIE WELL SUPPLY 1990 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Barrie well supply in January of 1990. This is the first DWSP annual report.

PLANT DESCRIPTION

The Barrie Well Supply is a groundwater source containing numerous wells in several aquifers. The only treatment provided is the addition of sodium silicate for iron sequestering and chlorine for disinfection. The combined system has a maximum pumping capacity of $67.58 \times 1000 \text{ m}^3/\text{day}$. The Barrie well supply serves a population of approximately 55,000.

Three wells were chosen as representative of the system. They were Tiffen well, Centennial well and Johnston Street well. The following tables and comments in this report will be arranged in the order listed above.

The sample day flows for the three wells ranged from $2.3 \times 1000 \text{ m}^3/\text{day}$ to $3.12 \times 1000 \text{ m}^3/\text{day}$, from $4.5 \times 1000 \text{ m}^3/\text{day}$ to $5.8 \times 1000 \text{ m}^3/\text{day}$ and from $5.3 \times 1000 \text{ m}^3/\text{day}$ to $5.7 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1.

SAMPLING AND ANALYSES

Sample lines at the wells were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples are used to

make an assessment of the change in the levels of inorganic compounds and metals, due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples therefore, were General Chemistry and Metals. The free flow sample represented fresh water from the distribution main, since the sample tap was flushed for five minutes prior to sampling.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (see Appendix B).

Plant operating personnel routinely analyze parameters for process control (Table 2).

Raw water from three wells and treated water from three locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall. Laboratory analysis were conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP data base as submitted by plant personnel.

Table 3 contains information on the delay time between raw and treated water sampling, flow rate and treatment chemicals dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on tables 5 and 6. Parameters are listed alphabetically within each

scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objectives (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

IN THIS REPORT DISCUSSION IS LIMITED TO:

- RESULTS FROM RAW AND DISTRIBUTED WATERS;
- THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES;
- POSITIVE ORGANIC PARAMETERS DETECTED; AS WELL AS
- PERSISTENT TRACES OF ORGANIC PARAMETERS IN THE RAW WATER.

In this report comments are combined for all sample locations for each parameter discussed. The water in the distribution system can be a mixture from many sources. Due to the many wells supplying this water system and the relatively few sample locations on DWSP, this report does not provide a complete picture of the drinking water quality.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples.

Standard plate count was the only bacteriological analysis conducted on the treated distributed water samples. No results were detected above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the delivered water may increase in the distribution system due to the warming effect of the soil in late summer and fall and/or as a result of higher

temperatures in the source water.

Field temperature exceeded the ODWO Maximum Desirable Concentration of 15°C in 1 of 32 distributed water samples with a reported value of 16.5°C.

CHEMISTRY (LAB)

Calcium exceeded the European Economic Community (EEC) Aesthetic Guideline Level of 100 mg/L in 2 of 32 distributed water samples with a maximum reported value of 102.9 mg/L.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the EEC Aesthetic Guideline Level of 400 umho/cm in all samples from two of the wells and in 29 of 32 distribution water samples with a maximum reported value of 737.0 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Aesthetic or Recommended Operational Guideline of 80-100 mg/L in all wells sampled and in all distribution samples with a maximum reported value of 330.0 mg/L.

Total ammonium exceeded the EEC Aesthetic Guideline Level of 0.05 mg/L in 8 of 12 samples from one well and in 3 of 12 samples in one distribution site with a maximum reported value of 0.072 mg/L.

PH exceeded the ODWO Aesthetic or Recommended Operational Guideline of 6.5-8.5 pH units in 1 distribution sample with a reported value of 8.54 pH units.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Units (FTU).

Laboratory turbidity levels reported above 1.0 FTU in the raw water samples may not have been indicative of turbidity at the sample point. Iron precipitation may have occurred in the sample bottle thus, increasing the turbidity value. Since iron sequestering is practiced at the Barrie wells, iron would remain in solution and

not affect turbidity levels.

METALS

Iron exceeded the ODWO Maximum Desirable Concentration of 300 ug/L in 10 of 32 distributed water samples with a maximum reported value of 370.0 ug/L. Iron sequestering is practised at wells in the Barrie supply, so the elevated concentrations should stay in solution and not cause aesthetic problems.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PHENOLICS

Phenols were only analyzed in the raw water and were not detected above the guideline.

POLYAROMATIC HYDROCARBONS (PAH)

The results of the PAH scan showed that none were detected.

PESTICIDES & PCB

The results of the PCB scan showed that none were detected.

The results of the regular pesticide scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticides scan showed that none were detected.

VOLATILES

Ethylbenzene was found at positive levels in 1 distributed water sample with a reported value of 0.7 ug/L. This was below the ODWO Aesthetic Objective of 2.4 ug/L.

M-xylene was found at positive levels in 1 distributed water sample with a reported value of 2.3 ug/L. This was below the ODWO Aesthetic Objective for total xylenes of 300 ug/L.

O-xylene was found at positive levels in 1 distributed water sample with a maximum reported value of 0.75 ug/L. This was below the ODWO Aesthetic Objective for total xylenes of 300 ug/L.

Methylene chloride (dichloromethane) was found at positive levels in 1 distributed water sample with a reported value of 6.0 ug/L. This was below the ODWO Maximum Acceptable Concentration of 50 ug/L.

1,1,1-Trichloroethane was found at positive levels in 1 distributed water sample with a reported value of 0.54 ug/L. This was below the United States Environmental Protection Agency Maximum Contaminant Level of 200 ug/L.

The above four volatile compounds were all detected in one sample from one of the distribution sites. Since these compounds were not detected in other results from this site, other houses and raw wells sampled, their source may be from wells not sampled.

Trichloroethylene was found at positive levels in 3 distributed water samples from two distribution sites with reported values ranging from 1.2 ug/L to 6.4 ug/L. This was below the ODWO Maximum Acceptable Concentration of 50 ug/L for trichloroethylene.

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane; bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THMs results are discussed.

Total THMs were found at positive levels in 8 and at trace levels in 23 of the 32 distribution samples analyzed. The maximum observed level was 7.6 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

CONCLUSIONS

The Barrie well supply, as sampled by DWSP, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

WORKS #: 220005875
PLANT NAME: BARRIE WELL SUPPLY

DISTRICT: BARRIE
REGION: CENTRAL
DISTRICT OFFICER :I. M. GRAY

UTM #: 1706280004979000

PLANT SUPERVISOR: D.N. CAMPBELL

ADDRESS: 55 PATTERSON ROAD
BARRIE, ONTARIO
L4M 4V8
(705 722 7222)

MUNICIPALITY: BARRIE
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	67.58	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
BARRIE	55,000

TABLE 2
 DRINKING WATER SURVEILLANCE PROGRAM
 AT THE THREE SAMPLED WELLS IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
FREE CHLORINE RESIDUAL	TREATED WATER	WEEKLY

TABLE 3
 DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE SAMPLE DAY CONDITIONS FOR 1990

		<u>TREATMENT CHEMICAL DOSAGE MG/L</u>	
		PRE CHLORINATION	IRON SEQUESTERING
		CHLORINE	SODIUM SILICATE
DATE	DELAY * TIME(HRS) (1000M3)	FLOW	
JAN 09	.00	.000	.70
FEB 21	.00	3.120	.95
MAR 13	.00	3.000	.59
APR 10	.00	3.380	.67
MAY 08	.00	2.990	.45
JUL 10	.00	.000	.67
AUG 14	.00	.000	.55
SEP 11	.00	.000	1.56
OCT 10	.00	.000	.66
NOV 13	.00	.000	.61
DEC 11	.00	.000	.79

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE SAMPLE DAY CONDITIONS F 1990

		TREATMENT CHEMICAL DOSAGE MG/L	
		PRE CHLORINATION	IRON SEQUESTERING
		CHLORINE	SODIUM SILICATE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)	
JAN 10	.00	.000	.78
FEB 21	.00	.000	.93
MAR 13	.00	4.530	.76
APR 10	.00	5.500	.64
MAY 08	.00	5.830	1.53
JUL 10	.00	.000	.92
AUG 14	.00	.000	.82
SEP 11	.00	.000	.75
OCT 10	.00	.000	.95
NOV 13	.00	.000	.97
DEC 11	.00	.000	.76

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE SAMPLE DAY CONDITIONS FOR 1990

		TREATMENT CHEMICAL DOSAGE MG/L	
		PRE CHLORINATION	IRON SEQUESTERING
		CHLORINE	SODIUM SILICATE
DATE	DELAY * TIME(HRS)	FLOW (1000M3)	
JAN 10	.00	.000	.39
FEB 21	.00	.000	.20
MAR 13	.00	5.680	.21
APR 10	.00	5.300	.23
MAY 08	.00	5.640	.23
JUL 10	.00	.000	.22
AUG 14	.00	.000	.23
SEP 11	.00	.000	.32
OCT 09	.00	.000	.22
NOV 13	.00	.000	.30
DEC 11	.00	.000	.30

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 1			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE

BACTERIOLOGICAL						
FECAL COLIFORM MF	12	0	0	.	.	.
STANDRD PLATE CNT MF	.	.	.	12	4	0
TOTAL COLIFORM MF	12	0	0	.	.	.
T COLIFORM BCKGRD MF	12	1	0	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	36	1	0	12	4	0

CHEMISTRY (FLD)						
FLD CHLORINE (COMB)	.	.	.	20	3	0
FLD CHLORINE FREE	.	.	.	22	10	0
FLD CHLORINE (TOTAL)	.	.	.	21	11	0
FLD PH	12	12	0	23	23	0
FLD TEMPERATURE	12	12	0	23	23	0
*TOTAL SCAN CHEMISTRY (FLD)	24	24	0	109	70	0

CHEMISTRY (LAB)						
ALKALINITY	12	12	0	24	24	0
CALCIUM	12	12	0	24	24	0
CYANIDE	12	0	0	.	.	.
CHLORIDE	12	12	0	24	24	0
COLOUR	12	12	0	24	22	2
CONDUCTIVITY	12	12	0	24	24	0
DISS ORG CARBON	12	12	0	24	24	0
FLUORIDE	12	11	1	24	20	4
HARDNESS	12	12	0	24	24	0
IONCAL	12	12	0	24	24	0
LANGELIERS INDEX	12	12	0	24	24	0
MAGNESIUM	12	12	0	24	24	0
SODIUM	12	12	0	24	24	0
AMMONIUM TOTAL	12	11	0	24	11	6
NITRITE	12	1	9	24	13	11
TOTAL NITRATES	12	2	7	24	17	6
NITROGEN TOT KJELD	12	6	6	24	5	19
PH	12	12	0	24	24	0
PHOSPHORUS FIL REACT	12	6	4	.	.	.
PHOSPHORUS TOTAL	12	3	8	.	.	.
SULPHATE	12	12	0	24	24	0
TURBIDITY	12	12	0	24	23	1
*TOTAL SCAN CHEMISTRY (LAB)	264	208	35	456	399	49

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 1			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

METALS						
SILVER	12	0	0	24	0	1
ALUMINUM	12	12	0	24	24	0
ARSENIC	12	0	12	24	0	21
BARIUM	12	12	0	24	24	0
BORON	12	6	6	24	12	12
BERYLLIUM	12	0	2	24	0	2
CADMIUM	12	0	0	24	0	2
COBALT	12	0	5	24	0	8
CHROMIUM	12	1	7	24	1	14
COPPER	12	0	1	24	24	0
IRON	12	11	1	24	24	0
MERCURY	12	0	0	.	.	.
MANGANESE	12	12	0	24	24	0
MOLYBDENUM	12	1	11	24	14	10
NICKEL	12	0	0	24	2	1
LEAD	12	1	9	24	11	13
ANTIMONY	12	0	12	24	2	22
SELENIUM	12	0	0	24	0	2
STRONTIUM	12	12	0	24	24	0
TITANIUM	12	12	0	24	24	0
THALLIUM	12	0	0	24	0	0
URANIUM	12	0	12	24	0	24
VANADIUM	12	0	6	24	0	16
ZINC	12	0	12	24	24	0
*TOTAL SCAN METALS	288	80	96	552	234	148
*TOTAL GROUP INORGANIC & PHYSICAL	576	312	131	1117	703	197

CHLOROAROMATICS						
HEXACHLOROBUTADIENE	10	0	0	10	0	0
123 TRICHLOROBENZENE	10	0	0	10	0	0
1234 T-CHLOROBENZENE	10	0	0	10	0	0
1235 T-CHLOROBENZENE	10	0	0	10	0	0
124 TRICHLOROBENZENE	10	0	0	10	0	0
1245 T-CHLOROBENZENE	10	0	0	10	0	0
135 TRICHLOROBENZENE	10	0	0	10	0	0
HCB	10	0	0	10	0	0
HEXACHLOROETHANE	10	0	0	10	0	0
OCTACHLOROSTYRENE	10	0	0	10	0	0
PENTACHLOROBENZENE	10	0	0	10	0	0
236 TRICHLOROTOLUENE	10	0	0	10	0	0
245 TRICHLOROTOLUENE	10	0	0	10	0	0
26A TRICHLOROTOLUENE	10	0	0	10	0	0
*TOTAL SCAN CHLOROAROMATICS	140	0	0	140	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 1			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE

CHLOROPHENOLS						
234 TRICHLOROPHENOL	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	0	0	0

PAH						
PHENANTHRENE	11	0	0	1	0	0
ANTHRACENE	10	0	0	1	0	0
FLUORANTHENE	11	0	0	1	0	0
PYRENE	11	0	0	1	0	0
BENZO(A)ANTHRACENE	11	0	0	1	0	0
CHRYSENE	11	0	0	1	0	0
DIMETH. BENZ(A)ANTHR	10	0	0	1	0	0
BENZO(E) PYRENE	11	0	0	1	0	0
BENZO(B) FLUORANTHEN	11	0	0	1	0	0
PERYLENE	11	0	0	1	0	0
BENZO(K) FLUORANTHEN	11	0	0	1	0	0
BENZO(A) PYRENE	11	0	0	1	0	0
BENZO(G,H,I) PERYLEN	11	0	0	1	0	0
DIBENZO(A,H) ANTHRAC	11	0	0	1	0	0
INDENO(1,2,3-C,D) PY	11	0	0	1	0	0
BENZO(B) CHRYSENE	11	0	0	1	0	0
CORONENE	11	0	0	1	0	0
*TOTAL SCAN PAH	185	0	0	17	0	0

PESTICIDES & PCB						
ALDRIN	10	0	0	10	0	0
ALPHA BHC	10	0	0	10	0	0
BETA BHC	10	0	0	10	0	0
LINDANE	10	0	0	10	0	0
ALPHA CHLORDANE	10	0	0	10	0	0
GAMMA CHLORDANE	10	0	0	10	0	0
DIELDRIN	10	0	0	10	0	0
METHOXYCHLOR	10	0	0	10	0	0
ENDOSULFAN I	10	0	0	10	0	0
ENDOSULFAN II	10	0	0	10	0	0
ENDRIN	10	0	0	10	0	0
ENDOSULFAN SULPHATE	10	0	0	10	0	0
HEPTACHLOR EPOXIDE	10	0	0	10	0	0
HEPTACHLOR	10	0	0	10	0	0
MIREX	10	0	0	10	0	0
OXYCHLORDANE	10	0	0	10	0	0
OPDDT	10	0	0	10	0	0
PCB	10	0	0	10	0	0
DDD	10	0	0	10	0	0
PPDDE	10	0	0	10	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 1			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
PPDDT	10	0	0	10	0	0
AMETRINE	12	0	0	.	.	.
ATRAZINE	12	0	0	.	.	.
ATRATONE	12	0	0	.	.	.
CYANAZINE (BLADEX)	12	0	0	.	.	.
DESETHYLATRAZINE	12	0	0	.	.	.
D-ETHYL SIMAZINE	11	0	0	.	.	.
PROMETONE	12	0	0	.	.	.
PROPACINE	12	0	0	.	.	.
PROMETRYNE	12	0	0	.	.	.
METRIBUZIN (SENCOR)	12	0	0	.	.	.
SIMAZINE	12	0	0	.	.	.
ALACHLOR (LASSO)	12	0	0	.	.	.
METOLACHLOR	12	0	0	.	.	.
HEXACLCYCLOPENTADIEN	3	0	0	3	0	0
*TOTAL SCAN PESTICIDES & PCB	368	0	0	213	0	0

PHENOLICS						
PHENOLICS	12	0	3	.	.	.
*TOTAL SCAN PHENOLICS	12	0	3	0	0	0

SPECIFIC PESTICIDES						
TOXAPHENE	10	0	0	10	0	0
2,4,5-T	2	0	0	.	.	.
2,4-D	2	0	0	.	.	.
2,4-DB	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	.	.	.
DICAMBA	2	0	0	.	.	.
PICHLORAM	0	0	0	.	.	.
SILVEX	2	0	0	.	.	.
DIAZINON	2	0	0	.	.	.
DICHLOROVOS	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	.	.	.
ETHION	2	0	0	.	.	.
AZINPHOS-METHYL	1	0	0	.	.	.
MALATHION	2	0	0	.	.	.
MEVINPHOS	2	0	0	.	.	.
METHYL PARATHION	2	0	0	.	.	.
METHYLTRITHION	2	0	0	.	.	.
PARATHION	2	0	0	.	.	.
PHORATE	2	0	0	.	.	.
RELDAN	2	0	0	.	.	.
RONNEL	2	0	0	.	.	.
AMINOCARB	0	0	0	.	.	.
BENONYL	0	0	0	.	.	.
BUX	0	0	0	.	.	.
CARBOFURAN	2	0	0	.	.	.
CICP	2	0	0	.	.	.
DIALATE	2	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 1			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
EPTAM	2	0	0	.	.	.
IPC	2	0	0	.	.	.
PROPOXUR	2	0	0	.	.	.
CARBARYL	2	0	0	.	.	.
BUTYLATE	2	0	0	.	.	.

*TOTAL SCAN SPECIFIC PESTICIDES						
	63	0	0	10	0	0

VOLATILES						
BENZENE	12	0	2	12	0	1
TOLUENE	12	0	0	12	0	0
ETHYLBENZENE	12	0	2	12	1	7
P-XYLENE	12	0	0	12	0	0
M-XYLENE	12	0	0	12	1	0
O-XYLENE	12	0	0	12	1	0
STYRENE	12	0	5	12	0	9
1,1 DICHLOROETHYLENE	12	0	0	12	0	0
METHYLENE CHLORIDE	12	0	0	12	1	0
1,2 DICHLOROETHYLENE	12	0	0	12	0	0
1,1 DICHLOROETHANE	12	0	0	12	0	0
CHLOROFORM	12	0	0	12	11	1
111, TRICHLOROETHANE	12	0	0	12	1	3
1,2 DICHLOROETHANE	12	0	0	12	0	0
CARBON TETRACHLORIDE	12	0	0	12	0	0
1,2 DICHLOROPROPANE	12	0	0	12	0	0
TRICHLOROETHYLENE	12	0	0	12	2	1
DICHLOROBROMOMETHANE	12	0	0	12	1	10
112 TRICHLOROETHANE	12	0	0	12	0	0
CHLORODIBROMOMETHANE	12	0	0	12	0	2
T-CHLOROETHYLENE	12	0	0	12	0	0
BROMOFORM	12	0	0	12	0	0
1122 T-CHLOROETHANE	12	0	0	12	0	0
CHLOROBENZENE	12	0	0	12	0	0
1,4 DICHLOROBENZENE	12	0	0	12	0	0
1,3 DICHLOROBENZENE	12	0	0	12	0	0
1,2 DICHLOROBENZENE	12	0	0	12	0	0
ETHYLENE DIBROMIDE	12	0	0	12	0	0
TOTL TRIHALOMETHANES	12	0	0	12	2	9

*TOTAL SCAN VOLATILES						
	348	0	9	348	21	43
*TOTAL GROUP ORGANIC						
	1128	0	12	728	21	43

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 2			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

BACTERIOLOGICAL						
FECAL COLIFORM MF	12	0	0	.	.	.
STANDRD PLATE CNT MF	.	.	.	12	4	0
TOTAL COLIFORM MF	12	0	0	.	.	.
T COLIFORM BCKGRD MF	12	0	0	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	36	0	0	12	4	0

CHEMISTRY (FLD).						
FLD CHLORINE (COMB)	1	1	0	21	16	0
FLD CHLORINE FREE	1	1	0	18	5	0
FLD CHLORINE (TOTAL)	1	1	0	21	20	0
FLD PH	12	12	0	24	24	0
FLD TEMPERATURE	12	12	0	23	23	0
*TOTAL SCAN CHEMISTRY (FLD)	27	27	0	107	88	0

CHEMISTRY (LAB)						
ALKALINITY	12	12	0	24	24	0
CALCIUM	12	12	0	24	24	0
CYANIDE	12	0	0	.	.	.
CHLORIDE	12	12	0	24	24	0
COLOUR	12	3	9	24	1	23
CONDUCTIVITY	12	12	0	24	24	0
DISS ORG CARBON	12	12	0	24	24	0
FLUORIDE	12	11	1	24	21	3
HARDNESS	12	12	0	24	24	0
IONCAL	12	12	0	24	24	0
LANGELIERS INDEX	12	12	0	24	24	0
MAGNESIUM	12	12	0	24	24	0
SODIUM	12	12	0	24	24	0
AMMONIUM TOTAL	12	12	0	24	21	2
NITRITE	12	1	6	24	4	18
TOTAL NITRATES	12	1	1	24	2	9
NITROGEN TOT KJELD	12	10	2	24	11	13
PH	12	12	0	24	24	0
PHOSPHORUS FIL REACT	12	3	8	.	.	.
PHOSPHORUS TOTAL	12	1	7	.	.	.
SULPHATE	12	12	0	24	24	0
TURBIDITY	12	12	0	24	23	1
*TOTAL SCAN CHEMISTRY (LAB)	264	198	34	456	371	69

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 2			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

METALS						
SILVER	12	0	0	24	0	1
ALUMINUM	12	12	0	24	24	0
ARSENIC	12	2	5	24	3	12
BARIUM	12	12	0	24	24	0
BORON	12	10	2	24	18	6
BERYLLIUM	12	0	2	24	0	3
CADMIUM	12	0	0	24	0	6
COBALT	12	0	5	24	0	12
CHROMIUM	12	1	8	24	0	18
COPPER	12	0	7	24	24	0
IRON	12	12	0	24	24	0
MERCURY	12	0	1	.	.	.
MANGANESE	12	12	0	24	24	0
MOLYBDENUM	12	12	0	24	24	0
NICKEL	12	0	0	24	1	2
LEAD	12	0	12	24	22	2
ANTIMONY	12	1	11	24	2	22
SELENIUM	12	0	2	24	0	8
STRONTIUM	12	12	0	24	24	0
TITANIUM	12	12	0	24	24	0
THALLIUM	12	0	0	24	0	0
URANIUM	12	0	12	24	0	24
VANADIUM	12	2	6	24	3	14
ZINC	12	1	10	24	23	1
*TOTAL SCAN METALS	288	101	83	552	264	131
*TOTAL GROUP INORGANIC & PHYSICAL	579	326	117	1115	723	200

CHLOROAROMATICS						
HEXACHLOROBUTADIENE	10	0	0	11	0	0
123 TRICHLOROBENZENE	10	0	0	11	0	0
1234 T-CHLOROBENZENE	10	0	0	11	0	0
1235 T-CHLOROBENZENE	10	0	0	11	0	0
124 TRICHLOROBENZENE	10	0	0	11	0	0
1245 T-CHLOROBENZENE	10	0	0	11	0	0
135 TRICHLOROBENZENE	10	0	0	11	0	0
HCB	10	0	0	11	0	0
HEXACHLOROETHANE	10	0	0	11	0	0
OCTACHLOROSTYRENE	10	0	0	11	0	0
PENTACHLOROBENZENE	10	0	0	11	0	0
236 TRICHLOROTOLUENE	10	0	0	11	0	0
245 TRICHLOROTOLUENE	10	0	0	11	0	0
26A TRICHLOROTOLUENE	10	0	0	11	0	0
*TOTAL SCAN CHLOROAROMATICS	140	0	0	154	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 2			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

CHLOROPHENOLS						
234 TRICHLOROPHENOL	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	0	0	0

PAH						
PHENANTHRENE	11	0	0	1	0	0
ANTHRACENE	10	0	0	1	0	0
FLUORANTHENE	11	0	0	1	0	0
PYRENE	11	0	0	1	0	0
BENZO(A)ANTHRACENE	11	0	0	1	0	0
CHRYSENE	11	0	0	1	0	0
DIMETH. BENZ(A)ANTHR	10	0	0	1	0	0
BENZO(E) PYRENE	11	0	0	1	0	0
BENZO(B) FLUORANTHEN	11	0	0	1	0	0
PERYLENE	11	0	0	1	0	0
BENZO(K) FLUORANTHEN	11	0	0	1	0	0
BENZO(A) PYRENE	11	0	0	1	0	0
BENZO(G,H,I) PERYLEN	11	0	0	1	0	0
DIBENZO(A,H) ANTHRAC	11	0	0	1	0	0
INDENO(1,2,3-C,D) PY	11	0	0	1	0	0
BENZO(B) CHRYSENE	11	0	0	1	0	0
CORONENE	11	0	0	1	0	0
*TOTAL SCAN PAH	185	0	0	17	0	0

PESTICIDES & PCB						
ALDRIN	10	0	0	11	0	0
ALPHA BHC	10	0	0	11	0	0
BETA BHC	10	0	0	11	0	0
LINDANE	10	0	0	11	0	0
ALPHA CHLORDANE	10	0	0	11	0	0
GAMMA CHLORDANE	10	0	0	11	0	0
DIELDRIN	10	0	0	11	0	0
METHOXYCHLOR	10	0	0	11	0	0
ENDOSULFAN I	10	0	0	11	0	0
ENDOSULFAN II	10	0	0	11	0	0
ENDRIN	10	0	0	11	0	0
ENDOSULFAN SULPHATE	10	0	0	11	0	0
HEPTACHLOR EPOXIDE	10	0	0	11	0	0
HEPTACHLOR	10	0	0	11	0	0
MIREX	10	0	0	11	0	0
OXYCHLORDANE	10	0	0	11	0	0
OPDDT	10	0	0	11	0	0
PCB	10	0	0	11	0	0
DDD	10	0	0	11	0	0
PPDDE	10	0	0	11	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 2			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
PPDDT	10	0	0	11	0	0
AMETRINE	12	0	0	.	.	.
ATRAZINE	12	0	0	.	.	.
ATRATONE	12	0	0	.	.	.
CYANAZINE (BLADEx)	12	0	0	.	.	.
DESETHYLATRAZINE	12	0	0	.	.	.
D-ETHYL SIMAZINE	11	0	0	.	.	.
PROMETONE	12	0	0	.	.	.
PROPazine	12	0	0	.	.	.
PROMETRYNE	12	0	0	.	.	.
METRIBUZIN (SENCOR)	12	0	0	.	.	.
SIMAZINE	12	0	0	.	.	.
ALACHLOR (LASSO)	12	0	0	.	.	.
METOLACHLOR	12	0	0	.	.	.
HEXACHLOROCYCLOPENTADIEN	3	0	0	3	0	0
*TOTAL SCAN PESTICIDES & PCB	368	0	0	234	0	0

PHENOLICS						
PHENOLICS	12	0	4	.	.	.
*TOTAL SCAN PHENOLICS	12	0	4	0	0	0

SPECIFIC PESTICIDES						
TOXAPHENE	10	0	0	11	0	0
2,4,5-T	2	0	0	.	.	.
2,4-D	2	0	0	.	.	.
2,4-DB	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	.	.	.
DICAMBA	2	0	0	.	.	.
PICHLORAM	0	0	0	.	.	.
SILVEX	2	0	0	.	.	.
DIAZINON	2	0	0	.	.	.
DICHLOROVOS	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	.	.	.
ETHION	2	0	0	.	.	.
AZINPHOS-METHYL	1	0	0	.	.	.
MALATHION	2	0	0	.	.	.
MEVINPHOS	2	0	0	.	.	.
METHYL PARATHION	2	0	0	.	.	.
METHYLTRITHION	2	0	0	.	.	.
PARATHION	2	0	0	.	.	.
PHORATE	2	0	0	.	.	.
RELDAN	2	0	0	.	.	.
RONNEL	2	0	0	.	.	.
AMINOCARB	0	0	0	.	.	.
BENONYL	0	0	0	.	.	.
BUX	0	0	0	.	.	.
CARBOFURAN	2	0	0	.	.	.
CICP	2	0	0	.	.	.
DIALATE	2	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 2			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
EPTAM	2	0	0	.	.	.
IPC	2	0	0	.	.	.
PROPOXUR	2	0	0	.	.	.
CARBARYL	2	0	0	.	.	.
BUTYLATE	2	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	63	0	0	11	0	0

VOLATILES						
BENZENE	12	0	1	12	0	1
TOLUENE	12	0	0	12	0	2
ETHYLBENZENE	12	0	6	12	0	9
P-XYLENE	12	0	0	12	0	0
M-XYLENE	12	0	0	12	0	0
O-XYLENE	12	0	0	12	0	1
STYRENE	12	0	8	12	0	9
1,1 DICHLOROETHYLENE	12	0	0	12	0	0
METHYLENE CHLORIDE	12	0	0	12	0	0
1,1,2 DICHLOROETHYLENE	12	0	0	12	0	0
1,1 DICHLOROETHANE	12	0	0	12	0	0
CHLOROFORM	12	0	0	12	2	10
111, TRICHLOROETHANE	12	0	1	12	0	2
1,2 DICHLOROETHANE	12	0	0	12	0	0
CARBON TETRACHLORIDE	12	0	0	12	0	0
1,2 DICHLOROPROPANE	12	0	0	12	0	0
TRICHLOROETHYLENE	12	0	0	12	1	0
DICHLOROBROMOMETHANE	12	0	0	12	5	7
112 TRICHLOROETHANE	12	0	0	12	0	0
CHLORODIBROMOMETHANE	12	0	0	12	1	11
T-CHLOROETHYLENE	12	0	0	12	0	0
BROMOFORM	12	0	0	12	0	5
1122 T-CHLOROETHANE	12	0	0	12	0	0
CHLOROBENZENE	12	0	0	12	0	0
1,4 DICHLOROBENZENE	12	0	0	12	0	0
1,3 DICHLOROBENZENE	12	0	0	12	0	0
1,2 DICHLOROBENZENE	12	0	0	12	0	0
ETHYLENE DIBROMIDE	12	0	0	12	0	0
TOTL TRIHALOMETHANES	12	0	0	12	1	11
*TOTAL SCAN VOLATILES	348	0	16	348	10	68
*TOTAL GROUP ORGANIC	1128	0	20	764	10	68

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 3			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

BACTERIOLOGICAL						
FECAL COLIFORM MF	12	0	0	.	.	.
STANDRD PLATE CNT MF	.	.	.	8	1	0
TOTAL COLIFORM MF	12	0	0	.	.	.
T COLIFORM BCKGRD MF	12	0	0	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	36	0	0	8	1	0

CHEMISTRY (FLD)						
FLD CHLORINE (COMB)	.	.	.	16	0	0
FLD CHLORINE FREE	.	.	.	16	16	0
FLD CHLORINE (TOTAL)	.	.	.	16	16	0
FLD PH	12	12	0	16	16	0
FLD TEMPERATURE	12	12	0	14	14	0
*TOTAL SCAN CHEMISTRY (FLD)	24	24	0	78	62	0

CHEMISTRY (LAB)						
ALKALINITY	12	12	0	16	16	0
CALCIUM	12	12	0	16	16	0
CYANIDE	12	0	0	.	.	.
CHLORIDE	12	12	0	16	16	0
COLOUR	12	0	6	16	1	7
CONDUCTIVITY	12	12	0	16	16	0
DISS ORG CARBON	12	11	1	16	15	1
FLUORIDE	12	10	2	16	12	4
HARDNESS	12	12	0	16	16	0
IONCAL	12	12	0	16	16	0
LANGELIERS INDEX	12	12	0	16	16	0
MAGNESIUM	12	12	0	16	16	0
SODIUM	12	12	0	16	16	0
AMMONIUM TOTAL	12	1	0	16	3	2
NITRITE	12	2	9	16	1	12
TOTAL NITRATES	12	12	0	16	16	0
NITROGEN TOT KJELD	12	3	9	16	6	10
PH	12	12	0	16	16	0
PHOSPHORUS FIL REACT	12	0	6	.	.	.
PHOSPHORUS TOTAL	12	0	5	.	.	.
SULPHATE	12	12	0	16	16	0
TURBIDITY	12	7	5	16	9	7
*TOTAL SCAN CHEMISTRY (LAB)	264	178	43	304	239	43

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 3			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

METALS						
SILVER	12	0	0	16	0	0
ALUMINUM	12	12	0	16	16	0
ARSENIC	12	1	9	16	0	11
BARIUM	12	12	0	16	16	0
BORON	12	4	8	16	8	8
BERYLLIUM	12	0	3	16	0	2
CADMIUM	12	0	0	16	0	3
COBALT	12	0	4	16	3	4
CHROMIUM	12	0	9	16	2	10
COPPER	12	0	12	16	16	0
IRON	12	0	4	16	0	2
MERCURY	12	0	2	.	.	.
MANGANESE	12	8	4	16	11	5
MOLYBDENUM	12	0	12	16	0	16
NICKEL	12	0	0	16	3	0
LEAD	12	2	10	16	11	5
ANTIMONY	12	0	12	16	4	12
SELENIUM	12	0	1	16	0	3
STRONTIUM	12	12	0	16	16	0
TITANIUM	12	12	0	16	16	0
THALLIUM	12	0	0	16	0	0
URANIUM	12	12	0	16	16	0
VANADIUM	12	5	7	16	4	12
ZINC	12	0	12	16	9	7
*TOTAL SCAN METALS	288	80	109	368	151	100
*TOTAL GROUP INORGANIC & PHYSICAL	576	282	152	750	452	143

CHLOROAROMATICS						
HEXACHLOROBUTADIENE	12	0	0	5	0	0
123 TRICHLOROBENZENE	12	0	0	5	0	0
1234 T-CHLOROBENZENE	12	0	0	5	0	0
1235 T-CHLOROBENZENE	12	0	0	5	0	0
124 TRICHLOROBENZENE	12	0	0	5	0	0
1245 T-CHLOROBENZENE	12	0	0	5	0	0
135 TRICHLOROBENZENE	12	0	0	5	0	0
HCB	12	0	0	5	0	0
HEXACHLOROETHANE	12	0	0	5	0	0
OCTACHLOROSTYRENE	12	0	0	5	0	0
PENTACHLOROBENZENE	12	0	0	5	0	0
236 TRICHLOROTOLUENE	12	0	0	5	0	0
245 TRICHLOROTOLUENE	12	0	0	5	0	0
26A TRICHLOROTOLUENE	12	0	0	5	0	0
*TOTAL SCAN CHLOROAROMATICS	168	0	0	70	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

	RAW 3			SITE 1		
SCAN PARAMETER	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		

CHLOROPHENOLS						
234 TRICHLOROPHENOL	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	.	.	.

*TOTAL SCAN CHLOROPHENOLS	12	0	0	0	0	0

PAH						
PHENANTHRENE	11	0	0	1	0	0
ANTHRACENE	10	0	0	1	0	0
FLUORANTHENE	11	0	0	1	0	0
PYRENE	11	0	0	1	0	0
BENZO(A)ANTHRACENE	11	0	0	1	0	0
CHRYSENE	11	0	0	1	0	0
DIMETH. BENZ(A)ANTHR	10	0	0	1	0	0
BENZO(E) PYRENE	11	0	0	1	0	0
BENZO(B) FLUORANTHEN	11	0	0	1	0	0
PERYLENE	11	0	0	1	0	0
BENZO(K) FLUORANTHEN	11	0	0	1	0	0
BENZO(A) PYRENE	11	0	0	1	0	0
BENZO(G,H,I) PERYLEN	11	0	0	1	0	0
DIBENZO(A,H) ANTHRAC	11	0	0	1	0	0
INDENO(1,2,3-C,D) PY	11	0	0	1	0	0
BENZO(B) CHRYSENE	11	0	0	1	0	0
CORONENE	11	0	0	1	0	0

*TOTAL SCAN PAH	185	0	0	17	0	0

PESTICIDES & PCB						
ALDRIN	12	0	0	5	0	0
ALPHA BHC	12	0	0	5	0	0
BETA BHC	12	0	0	5	0	0
LINDANE	12	0	0	5	0	0
ALPHA CHLORDANE	12	0	0	5	0	0
GAMMA CHLORDANE	12	0	0	5	0	0
DIELDRIN	12	0	0	5	0	0
METHOXYCHLOR	12	0	0	5	0	0
ENDOSULFAN I	12	0	0	5	0	0
ENDOSULFAN II	12	0	0	5	0	0
ENDRIN	12	0	0	5	0	0
ENDOSULFAN SULPHATE	12	0	0	5	0	0
HEPTACHLOR EPOXIDE	12	0	0	5	0	0
HEPTACHLOR	12	0	0	5	0	0
MIREX	12	0	0	5	0	0
OXYCHLORDANE	12	0	0	5	0	0
OPDDT	12	0	0	5	0	0
PCB	12	0	0	5	0	0
DDD	12	0	0	5	0	0
PPDDE	12	0	0	5	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 3			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
PPDDT	12	0	0	5	0	0
AMETRINE	11	0	0	.	.	.
ATRAZINE	11	0	0	.	.	.
ATRATONE	11	0	0	.	.	.
CYANAZINE (BLADEx)	11	0	0	.	.	.
DESETHYLATRAZINE	11	0	0	.	.	.
D-ETHYL SIMAZINE	10	0	0	.	.	.
PROMETONE	11	0	0	.	.	.
PROPAZINE	11	0	0	.	.	.
PROMETRYNE	11	0	0	.	.	.
METRIBUZIN (SENCOR)	11	0	0	.	.	.
SIMAZINE	11	0	0	.	.	.
ALACHLOR (LASSO)	11	0	0	.	.	.
METOLACHLOR	11	0	0	.	.	.
HEXACLCYCLOPENTADIEN	3	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB	397	0	0	107	0	0

PHENOLICS						
PHENOLICS	11	0	1	.	.	.
*TOTAL SCAN PHENOLICS	11	0	1	0	0	0

SPECIFIC PESTICIDES						
TOXAPHENE	12	0	0	5	0	0
2,4,5-T	2	0	0	.	.	.
2,4-D	2	0	0	.	.	.
2,4-DB	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	.	.	.
DICAMBA	2	0	0	.	.	.
PICHLORAM	0	0	0	.	.	.
SILVEX	2	0	0	.	.	.
DIAZINON	2	0	0	.	.	.
DICHLOROVOS	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	.	.	.
ETHION	2	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	.	.	.
MALATHION	2	0	0	.	.	.
MEVINPHOS	2	0	0	.	.	.
METHYL PARATHION	2	0	0	.	.	.
METHYLTRITHION	2	0	0	.	.	.
PARATHION	2	0	0	.	.	.
PHORATE	2	0	0	.	.	.
RELDAN	2	0	0	.	.	.
RONNEL	2	0	0	.	.	.
AMINOCARB	0	0	0	.	.	.
BENONYL	0	0	0	.	.	.
BUX	0	0	0	.	.	.
CARBOFURAN	2	0	0	.	.	.
CICP	2	0	0	.	.	.
DIALATE	2	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW 3			SITE 1		
	TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
EPTAM	2	0	0	.	.	.
IPC	2	0	0	.	.	.
PROPOXUR	2	0	0	.	.	.
CARBARYL	2	0	0	.	.	.
BUTYLATE	2	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES						
	64	0	0	5	0	0

VOLATILES						
BENZENE	12	0	1	8	0	0
TOLUENE	12	0	0	8	0	0
ETHYLBENZENE	12	0	6	8	0	2
P-XYLENE	12	0	0	8	0	0
M-XYLENE	12	0	0	8	0	0
O-XYLENE	12	0	0	8	0	0
STYRENE	12	0	8	8	0	2
1,1 DICHLOROETHYLENE	12	0	0	8	0	0
METHYLENE CHLORIDE	12	0	0	8	0	0
1,2 DICHLOROETHYLENE	12	0	0	8	0	0
1,1 DICHLOROETHANE	12	0	0	8	0	0
CHLOROFORM	12	0	0	8	5	3
111, TRICHLOROETHANE	12	0	2	8	0	1
1,2 DICHLOROETHANE	12	0	0	8	0	0
CARBON TETRACHLORIDE	12	0	0	8	0	0
1,2 DICHLOROPROPANE	12	0	0	8	0	0
TRICHLOROETHYLENE	12	0	0	8	0	0
DICHLOROBROMOMETHANE	12	0	0	8	8	0
112 TRICHLOROETHANE	12	0	0	8	0	0
CHLORODIBROMOMETHANE	12	0	0	8	6	2
T-CHLOROETHYLENE	12	0	0	8	0	0
BROMOFORM	12	0	0	8	0	6
1122 T-CHLOROETHANE	12	0	0	8	0	0
CHLOROBENZENE	12	0	0	8	0	0
1,4 DICHLOROBENZENE	12	0	0	8	0	0
1,3 DICHLOROBENZENE	12	0	0	8	0	0
1,2 DICHLOROBENZENE	12	0	0	8	0	0
ETHYLENE DIBROMIDE	12	0	0	8	0	0
TOTL TRIHALOMETHANES	12	0	0	8	5	3
*TOTAL SCAN VOLATILES						
	348	0	17	232	24	19
*TOTAL GROUP ORGANIC						
	1185	0	18	431	24	19

KEY TO TABLE 5 and 6

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline
- B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
4T. EPA Ambient Water Quality Criteria for Total PAH
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissible Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant

UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminate Interference
XP	Positive After X Number Of Hours
T#	(T06) Result Taken After # Hours

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

BACTERIOLOGICAL
FECAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 0 (A1)

JAN	0
FEB	BDL
MAR	0
APR	0
MAY	0
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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STANDRD PLATE CNT MF (COUNT/ML)

DET'N LIMIT = 0

GUIDELINE = 500/ML (A3)

JAN	.
FEB	.
MAR	.
APR	.
MAY	.
JUN	.
JUL	.
AUG	.
SEP	.
OCT	.
NOV	.
DEC	.

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29
6 <=>
12
3 <=>
6 <=>
0 <=>
1 <=>
13
20
1 <=>
5 <=>
1 <=>

TOTAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 5/100ML(A1)

JAN	0
FEB	BDL
MAR	BDL
APR	BDL
MAY	BDL
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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T COLIFORM BCKGRD MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = N/A

JAN	2
FEB	BDL
MAR	BDL
APR	BDL
MAY	BDL
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

CHEMISTRY (FLD)
FLD CHLORINE (COMB) (MG/L)

DET'N LIMIT = 0

GUIDELINE = N/A

JAN	.	.000	.000
FEB	.	.000	.000
MAR	.	.	.000
APR	.	.200	.200
JUN	.	.000	.000
JUL	.	.000	.100
AUG	.	.000	.000
SEP	.	.000	.000
OCT	.	.000	.000
NOV	.	.000	.000
DEC	.	.000	.

FLD CHLORINE FREE (MG/L)

DET'N LIMIT = 0

GUIDELINE = N/A

JAN	.	.100	.100
FEB	.	.100	.100
MAR	.	.100	.100
APR	.	.100	.100
JUN	.	.000	.000
JUL	.	.000	.000
AUG	.	.100	.100
SEP	.	.000	.000
OCT	.	.000	.000
NOV	.	.000	.000
DEC	.	.000	.000

FLD CHLORINE (TOTAL) (MG/L)

DET'N LIMIT = 0

GUIDELINE = N/A

JAN	.	.100	.100
FEB	.	.100	.100
MAR	.	.100	.100
APR	.	.300	.300
JUN	.	.000	.000
JUL	.	.000	.100
AUG	.	.100	.100
SEP	.	.000	.000
OCT	.	.000	.000
NOV	.	.000	.000
DEC	.	.000	.

FLD PH (DMNSLESS)

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

JAN	7.500	7.600	7.600
FEB	7.600	7.600	7.600
MAR	7.600	7.700	7.700
APR	7.500	7.700	7.700
MAY	7.600	7.700	.
JUN	7.700	7.700	7.700
JUL	7.500	7.600	7.500
AUG	7.600	7.600	7.600
SEP	7.600	7.600	7.600
OCT	7.700	7.700	7.700
NOV	7.600	7.800	7.700
DEC	7.700	7.900	7.700

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1		SITE 1	
		STANDING	FREE FLOW
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	
		GUIDELINE = 15 (A3)	
JAN	7.000	10.000	10.000
FEB	7.000	9.900	10.000
MAR	7.200	12.500	7.000
APR	7.000	16.000	8.000
MAY	8.500	18.200	.
JUN	8.800	13.000	11.000
JUL	8.000	17.000	12.000
AUG	9.800	20.500	15.000
SEP	8.500	19.200	16.500
OCT	7.500	14.800	13.400
NOV	7.000	18.200	12.200
DEC	7.200	17.000	10.900

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

CHEMISTRY (LAB)				
ALKALINITY (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A3)
JAN	199.700	201.600	209.000	
FEB	197.900	204.200	204.600	
MAR	195.200	199.100	196.800	
APR	200.800	203.600	204.500	
MAY	189.400	202.800	206.900	
JUN	195.300	196.400	197.900	
JUL	196.500	197.500	200.300	
AUG	196.000	205.200	200.000	
SEP	197.400	209.200	205.000	
OCT	193.000	192.500	194.000	
NOV	193.300	214.700	208.500	
DEC	197.800	206.900	197.800	
CALCIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 100 (F2)
JAN	59.100	61.700	66.300	
FEB	56.200	60.800	60.100	
MAR	59.400	60.800	60.000	
APR	57.200	61.200	61.400	
MAY	53.100	63.600	66.200	
JUN	58.800	59.200	59.600	
JUL	59.800	60.000	60.200	
AUG	62.100	66.200	63.900	
SEP	59.900	69.200	68.300	
OCT	62.700	61.800	60.700	
NOV	61.600	66.000	61.800	
DEC	58.400	61.600	58.200	
CHLORIDE (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 250 (A3)
JAN	1.200	7.800	25.400	
FEB	1.800	16.200	15.500	
MAR	1.700	9.700	4.200	
APR	1.600	11.500	11.600	
MAY	1.700	17.100	25.400	
JUN	1.900	2.400	2.000	
JUL	1.600	6.700	7.600	
AUG	2.000	6.900	6.500	
SEP	1.600	31.700	26.000	
OCT	2.000	2.900	2.700	
NOV	1.800	10.100	10.500	
DEC	2.000	10.400	2.700	
COLOUR (HZU)		DET'N LIMIT = 0.5		GUIDELINE = 5 (A3)
JAN	7.500	4.000	5.000	
FEB	7.000	3.500	4.500	
MAR	9.500	4.500	5.000	
APR	9.000	5.000	4.500	
MAY	5.000	3.000	3.000	
JUN	9.500	3.500	3.500	
JUL	7.000	4.000	4.500	
AUG	6.500	2.500	2.000 <T	
SEP	7.000	2.000 <T	3.500	
OCT	8.000	4.500	5.000	
NOV	6.500	2.500	4.000	
DEC	7.500	3.000	4.500	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1		SITE 1		
		STANDING	FREE FLOW	
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.		GUIDELINE = 400 (F2)
JAN	388	414	492	
FEB	388	444	443	
MAR	390	419	402	
APR	394	431	436	
MAY	393	463	492	
JUN	396	397	399	
JUL	393	410	414	
AUG	396	427	416	
SEP	381	508	482	
OCT	394	397	397	
NOV	396	455	430	
DEC	390	440	398	
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100		GUIDELINE = 5.0 (A3)
JAN	1.500	1.100	1.600	
FEB	1.200	1.300	1.300	
MAR	1.400	1.400	1.600	
APR	1.400	1.300	1.300	
MAY	1.100	1.200	1.300	
JUN	1.200	1.200	1.200	
JUL	1.200	1.300	1.300	
AUG	1.200	1.400	1.200	
SEP	1.500	1.000	1.300	
OCT	1.300	1.200	1.200	
NOV	1.100	1.100	1.200	
DEC	1.100	.900	1.000	
FLUORIDE (MG/L)		DET'N LIMIT = 0.01		GUIDELINE = 2.4 (A1)
JAN	.060	.080	.060	
FEB	.060	.060	.080	
MAR	.060	.040 <T	.040 <T	
APR	.060	.060	.080	
MAY	.060	.060	.060	
JUN	.060	.040 <T	.060	
JUL	.060	.060	.060	
AUG	.080	.080	.080	
SEP	.060	.040 <T	.060	
OCT	.060	.060	.060	
NOV	.060	.060	.060	
DEC	.040 <T	.080	.080	
HARDNESS (MG/L)		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)
JAN	203.500	216.600	233.300	
FEB	196.600	215.100	213.300	
MAR	207.000	214.000	211.000	
APR	198.000	217.000	217.000	
MAY	187.000	219.900	228.900	
JUN	205.000	207.000	208.000	
JUL	207.000	211.000	211.000	
AUG	212.500	226.200	218.800	
SEP	209.700	241.400	238.500	
OCT	213.800	212.800	208.700	
NOV	210.000	226.000	215.000	
DEC	198.000	210.000	199.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

IONCAL (DMNSLESS)

DET'N LIMIT = N/A

GUIDELINE = N/A

JAN	.581	2.947	.184
FEB	3.582	2.846	3.218
MAR	.541	.970	1.314
APR	4.221	.078	.165
MAY	5.043	.603	1.401
JUN	.008	.815	.427
JUL	.448	.801	.028
AUG	2.755	4.312	3.435
SEP	3.592	.958	4.082
OCT	4.005	3.778	1.270
NOV	3.858	1.086	4.155
DEC	3.595	3.732	3.543

LANGELIERS INDEX (DMNSLESS)

DET'N LIMIT = N/A

GUIDELINE = N/A

JAN	1.022	1.082	1.092
FEB	.966	1.129	1.025
MAR	.944	1.050	1.001
APR	.960	1.121	1.024
MAY	.752	.803	.847
JUN	.829	.855	.851
JUL	1.050	1.052	1.079
AUG	.865	.929	.874
SEP	1.084	1.069	1.077
OCT	.832	.825	.830
NOV	.995	1.235	1.196
DEC	.923	.990	.950

MAGNESIUM (MG/L)

DET'N LIMIT = 0.10

GUIDELINE = 30 (F2)

JAN	13.600	15.200	16.450
FEB	13.700	15.400	15.400
MAR	14.200	15.200	14.800
APR	13.500	15.500	15.600
MAY	13.200	14.850	15.450
JUN	14.200	14.400	14.300
JUL	14.000	14.800	14.800
AUG	14.000	14.800	14.350
SEP	14.600	16.650	16.500
OCT	13.900	14.200	13.900
NOV	13.600	14.700	14.800
DEC	12.700	13.700	13.000

SODIUM (MG/L)

DET'N LIMIT = 0.2

GUIDELINE = 200 (A4)

JAN	5.300	8.300	14.200
FEB	6.200	10.800	10.600
MAR	5.400	8.800	6.600
APR	5.400	9.000	8.800
MAY	6.200	11.800	14.500
JUN	5.400	6.400	6.200
JUL	5.000	7.400	8.000
AUG	5.800	8.200	8.000
SEP	5.800	16.800	15.300
OCT	5.500	6.100	6.100
NOV	5.800	8.800	7.400
DEC	6.200	11.000	7.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1		SITE 1	
		STANDING	FREE FLOW
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	
		GUIDELINE = 0.05 (F2)	
JAN	.034	.006 <T	.002 <T
FEB	.030	BDL	.006 <T
MAR	.028	.006 <T	.010
APR	.028	.042	.042
MAY	.026	.014	BDL
JUN	.024	.010	.016
JUL	.030	.008 <T	.014
AUG	.038	BDL	BDL
SEP	.020	BDL	BDL
OCT	.038	.024	.022
NOV	.038	.002 <T	.014
DEC	.032	BDL	.010
NITRITE (MG/L)		DET'N LIMIT = 0.001	
		GUIDELINE = 1 (A1)	
JAN	.002 <T	.033	.025
FEB	.001 <T	.010	.022
MAR	.004 <T	.015	.017
APR	.002 <T	.007	.007
MAY	.003 <T	.010	.004 <T
JUN	.001 <T	.001 <T	.001 <T
JUL	.008	.014	.019
AUG	.001 <T	.002 <T	.002 <T
SEP	.002 <T	.003 <T	.004 <T
OCT	BDL	.004 <T	.003 <T
NOV	.001 <T	.002 <T	.004 <T
DEC	BDL	.012	.005
TOTAL NITRATES (MG/L)		DET'N LIMIT = 0.005	
		GUIDELINE = 10 (A1)	
JAN	.005 <T	.075	.080
FEB	.010 <T	.065	.055
MAR	.005 <T	.065	.030
APR	.085	.020 <T	.020 <T
MAY	.090	.135	.165
JUN	.005 <T	.005 <T	BDL
JUL	.010 <T	.060	.035
AUG	BDL	.055	.055
SEP	BDL	.060	.050
OCT	.010 <T	.005 <T	.010 <T
NOV	BDL	.065	.040
DEC	.010 <T	.040	.005 <T
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02	
		GUIDELINE = N/A	
JAN	.110	.080 <T	.090 <T
FEB	.110	.110	.100
MAR	.100	.080 <T	.060 <T
APR	.120	.190	.110
MAY	.070 <T	.080 <T	.070 <T
JUN	.090 <T	.080 <T	.090 <T
JUL	.080 <T	.100	.060 <T
AUG	.110	.080 <T	.080 <T
SEP	.060 <T	.030 <T	.030 <T
OCT	.100	.060 <T	.060 <T
NOV	.080 <T	.080 <T	.060 <T
DEC	.050 <T	.030 <T	.030 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 1		SITE 1	
		STANDING	FREE FLOW
PH (DMNSLESS)		DET'N LIMIT = N/A	
		GUIDELINE = 6.5-8.5(A4)	
JAN	8.400	8.440	8.410
FEB	8.370	8.490	8.390
MAR	8.330	8.420	8.380
APR	8.350	8.480	8.380
MAY	8.200	8.150	8.170
JUN	8.220	8.240	8.230
JUL	8.430	8.430	8.450
AUG	8.230	8.250	8.220
SEP	8.460	8.370	8.390
OCT	8.200	8.200	8.210
NOV	8.370	8.540	8.540
DEC	8.310	8.340	8.340
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005	
		GUIDELINE = N/A	
JAN	.002 <T	.	.
FEB	.001 <T	.	.
MAR	.001 <T	.	.
APR	BDL	.	.
MAY	.001 <T	.	.
JUN	.002	.	.
JUL	.002	.	.
AUG	.003	.	.
SEP	BDL	.	.
OCT	.003	.	.
NOV	.003	.	.
DEC	.004	.	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002	
		GUIDELINE = .40 (F2)	
JAN	.003 <T	.	.
FEB	.017	.	.
MAR	.003 <T	.	.
APR	.003	.	.
MAY	.004 <T	.	.
JUN	.002 <T	.	.
JUL	.005 <T	.	.
AUG	.004	.	.
SEP	BDL	.	.
OCT	.004 <T	.	.
NOV	.004 <T	.	.
DEC	.004 <T	.	.
SULPHATE (MG/L)		DET'N LIMIT = .200	
		GUIDELINE = 500 (A3)	
JAN	14.360	14.420	18.660
FEB	16.610	17.370	16.710
MAR	18.970	17.470	18.530
APR	14.960	15.510	15.550
MAY	17.720	18.910	19.900
JUN	18.320	18.640	18.740
JUL	19.220	17.090	16.810
AUG	19.710	18.040	18.030
SEP	14.290	20.180	18.380
OCT	20.430	20.390	20.600
NOV	17.630	17.090	16.710
DEC	17.850	20.250	19.190

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1		SITE 1	
		STANDING	FREE FLOW
TURBIDITY (FTU)		DET'N LIMIT = 0.05	
		GUIDELINE = 1 (A1)	
JAN	2.100	.740	.760
FEB	3.500	.990	1.040
MAR	3.700	.770	.680
APR	3.300	.370	.440
MAY	3.600	.640	.990
JUN	3.500	.300	.350
JUL	3.100	.270	.570
AUG	2.500	.490	.410
SEP	2.400	.180 <T	.360
OCT	3.000	.490	.540
NOV	2.900	.250	.500
DEC	4.000	.190	.660

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 1		SITE 1	
		STANDING	FREE FLOW
<hr/>			
METALS			
SILVER (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50 (A1)
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	BDL	BDL	.060 <T
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
<hr/>			
ALUMINUM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
JAN	5.400	7.300	7.900
FEB	9.900	11.000	12.000
MAR	12.000	14.000	14.000
APR	12.000	14.000	14.000
MAY	45.000	49.000	43.000
JUN	5.100	6.200	5.800
JUL	6.400	9.200	7.500
AUG	8.900	10.000	8.400
SEP	6.400	8.000	7.800
OCT	1.900	2.400	2.500
NOV	1.600	2.100	2.100
DEC	2.000	2.400	2.200
<hr/>			
ARSENIC (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
JAN	.530 <T	.250 <T	.420 <T
FEB	.430 <T	.410 <T	.350 <T
MAR	.350 <T	.320 <T	.280 <T
APR	.720 <T	.260 <T	.210 <T
MAY	.470 <T	.370 <T	.220 <T
JUN	.280 <T	.280 <T	.230 <T
JUL	.480 <T	.270 <T	.230 <T
AUG	.250 <T	.130 <T	BDL
SEP	.500 <T	BDL	BDL
OCT	.410 <T	.420 <T	.280 <T
NOV	.500 <T	.250 <T	.420 <T
DEC	.640 <T	.110 <T	.310 <T
<hr/>			
BARIUM (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
JAN	220.000	200.000	220.000
FEB	200.000	170.000	170.000
MAR	200.000	200.000	200.000
APR	210.000	180.000	180.000
MAY	200.000	200.000	210.000
JUN	200.000	180.000	180.000
JUL	220.000	210.000	200.000
AUG	200.000	220.000	190.000
SEP	210.000	230.000	190.000
OCT	200.000	190.000	190.000
NOV	190.000	190.000	170.000
DEC	210.000	220.000	170.000
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TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 1		SITE 1	
		STANDING	FREE FLOW
BORON (UG/L)		DET'N LIMIT = 2.00	
		GUIDELINE = 5000 (A1)	
JAN	13.000 <T	15.000 <T	14.000 <T
FEB	12.000 <T	11.000 <T	12.000 <T
MAR	34.000	45.000	43.000
APR	30.000	32.000	23.000
MAY	100.000	96.000	26.000
JUN	18.000 <T	26.000	20.000 <T
JUL	27.000	27.000	29.000
AUG	36.000	22.000	12.000 <T
SEP	12.000 <T	17.000 <T	14.000 <T
OCT	21.000	22.000	21.000
NOV	15.000 <T	16.000 <T	12.000 <T
DEC	11.000 <T	15.000 <T	17.000 <T
BERYLLIUM (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 6800 (D4)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	.090 <T
APR	.060 <T	BDL	BDL
MAY	.120 <T	.120 <T	BDL
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
CADMIUM (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 5 (A1)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	BDL	BDL	BDL
JUN	BDL	BDL	BDL
JUL	BDL	.060 <T	BDL
AUG	BDL	.130 <T	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
COBALT (UG/L)		DET'N LIMIT = 0.02	
		GUIDELINE = N/A	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	.090 <T	.060 <T	.070 <T
MAY	BDL	.140 <T	.520 <T
JUN	.160 <T	.100 <T	.130 <T
JUL	.050 <T	.070 <T	.070 <T
AUG	BDL	BDL	BDL
SEP	.100 <T	BDL	BDL
OCT	BDL	BDL	BDL
NOV	.030 <T	BDL	BDL
DEC	BDL	BDL	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

CHROMIUM (UG/L)

DET'N LIMIT = 0.50

GUIDELINE = 50 (A1)

JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	3.100 <T	4.200 <T	4.200 <T
APR	2.600 <T	2.700 <T	1.100 <T
MAY	5.300	5.100	BDL
JUN	1.800 <T	3.700 <T	2.300 <T
JUL	3.600 <T	3.000 <T	3.300 <T
AUG	4.500 <T	1.200 <T	BDL
SEP	BDL	BDL	BDL
OCT	4.400 <T	4.700 <T	4.300 <T
NOV	1.500 <T	1.500 <T	.600 <T
DEC	BDL	BDL	2.600 <T

COPPER (UG/L)

DET'N LIMIT = 0.50

GUIDELINE = 1000 (A3)

JAN	BDL	170.000	100.000
FEB	BDL	310.000	71.000
MAR	BDL	230.000	53.000
APR	BDL	150.000	140.000
MAY	BDL	76.000	720.000
JUN	BDL	170.000	140.000
JUL	BDL	270.000	140.000
AUG	BDL	350.000	190.000
SEP	BDL	580.000	210.000
OCT	BDL	130.000	140.000
NOV	BDL	480.000	170.000
DEC	1.700 <T	480.000	130.000

IRON (UG/L)

DET'N LIMIT = 6.00

GUIDELINE = 300 (A3)

JAN	380.000	360.000	310.000
FEB	400.000	320.000	360.000
MAR	410.000	330.000	370.000
APR	400.000	360.000	360.000
MAY	370.000	330.000	270.000
JUN	7.700 <T	110.000	110.000
JUL	420.000	320.000	340.000
AUG	350.000	220.000	310.000
SEP	440.000	180.000	340.000
OCT	400.000	330.000	340.000
NOV	360.000	190.000	310.000
DEC	410.000	140.000	300.000

MANGANESE (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 50 (A3)

JAN	21.000	26.000	31.000
FEB	18.000	21.000	21.000
MAR	19.000	23.000	22.000
APR	19.000	26.000	26.000
MAY	20.000	23.000	33.000
JUN	16.000	31.000	31.000
JUL	21.000	27.000	24.000
AUG	18.000	35.000	24.000
SEP	20.000	32.000	26.000
OCT	18.000	21.000	20.000
NOV	17.000	23.000	20.000
DEC	18.000	22.000	18.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1		SITE 1	
		STANDING	FREE FLOW
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = N/A	
JAN	.500 <T	.620	.550
FEB	.480 <T	.530	.420 <T
MAR	.440 <T	.510	.470 <T
APR	.410 <T	.530	.480 <T
MAY	.500 <T	.550	.490 <T
JUN	.620	.370 <T	.400 <T
JUL	.430 <T	.600	.560
AUG	.470 <T	.560	.470 <T
SEP	.500 <T	.600	.510
OCT	.470 <T	.480 <T	.510
NOV	.420 <T	.500 <T	.520
DEC	.470 <T	.510	.410 <T
NICKEL (UG/L)		DET'N LIMIT = 0.20	
		GUIDELINE = 350 (D3)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	BDL	4.800	38.000
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	.740 <T	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
LEAD (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 10. (A1)	
JAN	.790	.520	.350 <T
FEB	.180 <T	1.700	.170 <T
MAR	BDL	.960	.190 <T
APR	.080 <T	.280 <T	.230 <T
MAY	.090 <T	.360 <T	2.700
JUN	BDL	.300 <T	.240 <T
JUL	.080 <T	1.400	.340 <T
AUG	.120 <T	2.300	.520
SEP	.090 <T	.540	.550
OCT	.060 <T	.390 <T	.400 <T
NOV	.060 <T	.820	.400 <T
DEC	.140 <T	.950	.330 <T
ANTIMONY (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 146 (D4)	
JAN	.280 <T	.310 <T	.370 <T
FEB	.350 <T	.540	.360 <T
MAR	.350 <T	.310 <T	.330 <T
APR	.370 <T	.340 <T	.290 <T
MAY	.220 <T	.270 <T	.440 <T
JUN	.360 <T	.230 <T	.270 <T
JUL	.330 <T	.360 <T	.240 <T
AUG	.280 <T	.380 <T	.270 <T
SEP	.250 <T	.410 <T	.670
OCT	.280 <T	.300 <T	.340 <T
NOV	.380 <T	.370 <T	.470 <T
DEC	.470 <T	.450 <T	.420 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

SELENIUM (UG/L)		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)
JAN	BDL	BDL	1.100 <T	
FEB	BDL	BDL	BDL	
MAR	BDL	BDL	BDL	
APR	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	1.300 <T	BDL	
STRONTIUM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = N/A
JAN	190.000	220.000	230.000	
FEB	170.000	180.000	180.000	
MAR	180.000	200.000	190.000	
APR	180.000	200.000	200.000	
MAY	180.000	200.000	220.000	
JUN	170.000	170.000	160.000	
JUL	180.000	190.000	190.000	
AUG	170.000	200.000	180.000	
SEP	190.000	230.000	220.000	
OCT	170.000	180.000	170.000	
NOV	180.000	190.000	180.000	
DEC	190.000	200.000	160.000	
TITANIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = N/A
JAN	12.000	14.000	13.000	
FEB	12.000	14.000	14.000	
MAR	16.000	16.000	16.000	
APR	17.000	18.000	18.000	
MAY	25.000	27.000	28.000	
JUN	33.000	34.000	36.000	
JUL	19.000	20.000	21.000	
AUG	31.000	38.000	35.000	
SEP	34.000	41.000	37.000	
OCT	21.000	22.000	23.000	
NOV	18.000	20.000	19.000	
DEC	29.000	35.000	28.000	
URANIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)
JAN	.210 <T	.240 <T	.360 <T	
FEB	.250 <T	.190 <T	.170 <T	
MAR	.220 <T	.270 <T	.240 <T	
APR	.240 <T	.200 <T	.180 <T	
MAY	.260 <T	.310 <T	.320 <T	
JUN	.270 <T	.240 <T	.270 <T	
JUL	.300 <T	.240 <T	.300 <T	
AUG	.270 <T	.240 <T	.250 <T	
SEP	.200 <T	.340 <T	.220 <T	
OCT	.270 <T	.280 <T	.280 <T	
NOV	.280 <T	.230 <T	.230 <T	
DEC	.260 <T	.340 <T	.270 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

		STANDING	FREE FLOW	
VANADIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A
JAN	BDL	.120 <T	.250 <T	
FEB	.070 <T	.240 <T	.250 <T	
MAR	.070 <T	.100 <T	.060 <T	
APR	.060 <T	.080 <T	.090 <T	
MAY	.080 <T	.110 <T	.120 <T	
JUN	BDL	.060 <T	.060 <T	
JUL	.060 <T	.060 <T	.080 <T	
AUG	BDL	.060 <T	BDL	
SEP	.070 <T	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	.080 <T	
ZINC (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)
JAN	.990 <T	16.000	11.000	
FEB	1.200 <T	21.000	8.500	
MAR	1.300 <T	18.000	6.900	
APR	.700 <T	9.000	8.100	
MAY	1.500 <T	9.800	23.000	
JUN	.910 <T	8.100	7.900	
JUL	1.100 <T	19.000	8.300	
AUG	1.200 <T	48.000	11.000	
SEP	1.000 <T	12.000	11.000	
OCT	1.000 <T	9.100	7.900	
NOV	1.600 <T	17.000	11.000	
DEC	1.700 <T	13.000	9.500	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

PHENOLICS (UG/L)		PHENOLICS)		DET'N LIMIT = .200	GUIDELINE = 2 (A4)
JAN	BDL	.	.	.	.
FEB	BDL	.	.	.	.
MAR	.400 <T	.	.	.	.
APR	BDL	.	.	.	.
MAY	BDL	.	.	.	.
JUN	BDL	.	.	.	.
JUL	BDL	.	.	.	.
AUG	BDL	.	.	.	.
SEP	BDL	.	.	.	.
OCT	BDL	.	.	.	.
NOV	.600 <T	.	.	.	.
DEC	.800 <T	.	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

VOLATILES		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)
BENZENE (UG/L))			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	.050 <T	.	.100 <T	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	.100 <T	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 2.4 (A3)
)			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	.150 <T	.	.200 <T	
APR	BDL	.	BDL	
MAY	BDL	.	.100 <T	
JUN	BDL	.	.050 <T	
JUL	BDL	.	.050 <T	
AUG	BDL	.	.050 <T	
SEP	BDL	.	.050 <T	
OCT	BDL	.	.100 <T	
NOV	BDL	.	BDL	
DEC	.050 <T	.	.700	
M-XYLENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)
)			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	BDL	.	BDL	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	2.300	
O-XYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)
)			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	BDL	.	BDL	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	.750	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 1		SITE 1	
		STANDING	FREE FLOW
STYRENE (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 100 (D1)	
JAN	BDL	.	BDL
FEB	.100 <T	.	.150 <T
MAR	.200 <T	.	.400 <T
APR	BDL	.	BDL
MAY	BDL	.	.200 <T
JUN	BDL	.	.150 <T
JUL	BDL	.	.100 <T
AUG	BDL	.	.100 <T
SEP	.050 <T	.	.150 <T
OCT	BDL	.	.100 <T
NOV	.100 <T	.	.050 <T
DEC	.100 <T	.	BDL
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50	
		GUIDELINE = 50 (A1)	
JAN	BDL	.	BDL
FEB	BDL	.	BDL
MAR	BDL	.	BDL
APR	BDL	.	BDL
MAY	BDL	.	BDL
JUN	BDL	.	BDL
JUL	BDL	.	BDL
AUG	BDL	.	BDL
SEP	BDL	.	BDL
OCT	BDL	.	BDL
NOV	BDL	.	BDL
DEC	BDL	.	6.000
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10	
		GUIDELINE = 350 (A1+)	
JAN	BDL	.	4.600
FEB	BDL	.	4.300
MAR	BDL	.	1.500
APR	BDL	.	2.900
MAY	BDL	.	1.500
JUN	BDL	.	.200 <T
JUL	BDL	.	3.900
AUG	BDL	.	3.200
SEP	BDL	.	5.900
OCT	BDL	.	2.100
NOV	BDL	.	3.900
DEC	BDL	.	2.400
111, TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.02	
		GUIDELINE = 200 (D1)	
JAN	BDL	.	.120 <T
FEB	BDL	.	BDL
MAR	BDL	.	BDL
APR	BDL	.	BDL
MAY	BDL	.	BDL
JUN	BDL	.	.080 <T
JUL	BDL	.	BDL
AUG	BDL	.	BDL
SEP	BDL	.	BDL
OCT	BDL	.	.020 <T
NOV	BDL	.	BDL
DEC	BDL	.	.540

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM TIFFIN WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 1

SITE 1

STANDING

FREE FLOW

TRICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)
JAN	BDL	BDL	
FEB	BDL	1.200	
MAR	BDL	BDL	
APR	BDL	BDL	
MAY	BDL	.600 <T	
JUN	BDL	BDL	
JUL	BDL	BDL	
AUG	BDL	BDL	
SEP	BDL	1.700	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
JAN	BDL	.450 <T	
FEB	BDL	.500 <T	
MAR	BDL	.150 <T	
APR	BDL	.250 <T	
MAY	BDL	.150 <T	
JUN	BDL	BDL	
JUL	BDL	.450 <T	
AUG	BDL	.350 <T	
SEP	BDL	.650	
OCT	BDL	.350 <T	
NOV	BDL	.400 <T	
DEC	BDL	.400 <T	
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
JAN	BDL	BDL	
FEB	BDL	.100 <T	
MAR	BDL	BDL	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	BDL	
AUG	BDL	BDL	
SEP	BDL	.200 <T	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
TOTAL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
JAN	BDL	5.050	
FEB	BDL	4.950 <T	
MAR	BDL	1.650 <T	
APR	BDL	3.150 <T	
MAY	BDL	1.650 <T	
JUN	BDL	BDL	
JUL	BDL	4.350 <T	
AUG	BDL	3.600 <T	
SEP	BDL	6.700	
OCT	BDL	2.400 <T	
NOV	BDL	4.250 <T	
DEC	BDL	2.800 <T	

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 2		SITE 1	
		STANDING	FREE FLOW
<hr/>			
BACTERIOLOGICAL			
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 0 (A1)
JAN	0	.	.
FEB	BDL	.	.
MAR	0	.	.
APR	0	.	.
MAY	0	.	.
JUN	0	.	.
JUL	0	.	.
AUG	0	.	.
SEP	0	.	.
OCT	0	.	.
NOV	0	.	.
DEC	0	.	.
<hr/>			
STANDRD PLATE CNT MF (COUNT/ML)		DET'N LIMIT = 0	GUIDELINE = 500/ML (A3)
JAN	.	4 <=>	
FEB	.	10	
MAR	.	1 <=>	
APR	.	0 <=>	
MAY	.	0 <=>	
JUN	.	25	
JUL	.	0 <=>	
AUG	.	10	
SEP	.	8 <=>	
OCT	.	16	
NOV	.	6 <=>	
DEC	.	0 <=>	
<hr/>			
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
JAN	BDL	.	.
FEB	BDL	.	.
MAR	BDL	.	.
APR	BDL	.	.
MAY	BDL	.	.
JUN	0	.	.
JUL	0	.	.
AUG	0	.	.
SEP	0	.	.
OCT	0	.	.
NOV	0	.	.
DEC	0	.	.
<hr/>			
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A
JAN	BDL	.	.
FEB	BDL	.	.
MAR	BDL	.	.
APR	BDL	.	.
MAY	BDL	.	.
JUN	0	.	.
JUL	0	.	.
AUG	0	.	.
SEP	0	.	.
OCT	0	.	.
NOV	0	.	.
DEC	0	.	.
<hr/>			

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 2		SITE 1	
		STANDING	FREE FLOW

CHEMISTRY (FLD)			
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A
JAN	.000	.000	
FEB	.000	.000	
MAR	.	.300	
APR	.200	.300	
JUN	.100	.100	
JUL	.100	.100	
AUG	.100	.200	
SEP	.100	.200	
OCT	.000	.100	
NOV	.200	.100	
DEC	.100	.100	

FLD CHLORINE FREE (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A
JAN	.100	.100	
FEB	.100	.200	
APR	.000	.000	
JUN	.000	.000	
JUL	.000	.000	
AUG	.000	.100	
SEP	.000	.000	
OCT	.000	.000	
NOV	.300	.000	

FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A
JAN	.100	.100	
FEB	.100	.200	
MAR	.	.300	
APR	.200	.300	
JUN	.100	.100	
JUL	.100	.100	
AUG	.100	.300	
SEP	.100	.200	
OCT	.000	.100	
NOV	.050	.100	
DEC	.100	.100	

FLD PH (DMNSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
JAN	7.600	7.600	7.600
FEB	7.500	7.600	7.600
MAR	7.500	7.500	7.500
APR	7.500	7.500	7.500
MAY	7.500	7.500	7.500
JUN	7.500	7.400	7.400
JUL	7.600	7.600	7.600
AUG	7.500	7.500	7.500
SEP	7.500	7.500	7.500
OCT	7.500	7.500	7.500
NOV	7.300	7.800	7.800
DEC	7.500	7.500	7.500

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2		SITE 1	
		STANDING	FREE FLOW
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	
		GUIDELINE = 15 (A3)	
JAN	8.000	9.000	8.000
FEB	8.000	9.800	10.000
MAR	7.800	10.000	4.000
APR	9.000	4.300	4.000
MAY	8.600	9.500	9.500
JUN	8.900	17.000	13.000
JUL	8.800	16.000	14.000
AUG	8.500	16.500	12.000
SEP	8.000	15.500	11.000
OCT	8.500	14.000	11.700
NOV	7.500	9.000	7.000
DEC	7.500	.	7.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 2		SITE 1	
		STANDING	FREE FLOW

CHEMISTRY (LAB)			
ALKALINITY (MG/L)		DET'N LIMIT = 0.2	
GUIDELINE = 30-500 (A3)			
JAN	211.900	213.700	215.700
FEB	204.100	212.100	212.100
MAR	209.500	210.300	209.000
APR	203.400	212.300	209.800
MAY	206.500	209.200	209.500
JUN	209.000	207.400	209.200
JUL	207.700	209.500	210.000
AUG	208.900	209.800	209.900
SEP	205.600	205.500	205.800
OCT	202.700	204.900	203.700
NOV	215.200	206.200	202.400
DEC	210.400	210.800	210.600

CALCIUM (MG/L)		DET'N LIMIT = 0.2	
GUIDELINE = 100 (F2)			
JAN	88.900	90.400	81.800
FEB	80.100	81.200	82.300
MAR	84.800	89.800	87.800
APR	79.800	86.200	84.400
MAY	80.100	81.800	81.800
JUN	81.400	85.000	85.000
JUL	80.000	82.200	79.600
AUG	83.800	88.000	85.500
SEP	83.300	85.700	85.500
OCT	80.300	84.200	83.000
NOV	86.200	88.400	86.200
DEC	85.500	90.000	88.500

CHLORIDE (MG/L)		DET'N LIMIT = 0.2	
GUIDELINE = 250 (A3)			
JAN	115.000	95.700	50.100
FEB	92.400	97.200	94.700
MAR	97.100	98.500	99.000
APR	97.500	97.100	97.500
MAY	90.000	92.300	92.400
JUN	87.300	87.300	87.600
JUL	83.700	84.000	84.500
AUG	86.900	89.500	86.200
SEP	79.100	80.500	80.200
OCT	83.100	85.100	84.500
NOV	81.500	85.800	83.900
DEC	87.200	93.200	91.500

COLOUR (NZU)		DET'N LIMIT = 0.5	
GUIDELINE = 5 (A3)			
JAN	2.000 <T	2.000 <T	3.000
FEB	1.500 <T	1.000 <T	.500 <T
MAR	3.500	1.500 <T	1.000 <T
APR	1.000 <T	1.000 <T	.500 <T
MAY	2.000 <T	1.000 <T	1.500 <T
JUN	3.500	1.500 <T	1.500 <T
JUL	2.000 <T	1.000 <T	1.000 <T
AUG	1.500 <T	.500 <T	.500 <T
SEP	2.000 <T	1.500 <T	1.500 <T
OCT	2.500	1.000 <T	2.000 <T
NOV	1.500 <T	1.000 <T	1.000 <T
DEC	2.000 <T	1.000 <T	1.500 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 2		SITE 1	
		STANDING	FREE FLOW
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.	
		GUIDELINE = 400 (F2)	
JAN	806	745	604
FEB	709	730	726
MAR	734	740	737
APR	739	748	732
MAY	708	723	723
JUN	709	705	711
JUL	687	690	694
AUG	685	707	699
SEP	669	672	661
OCT	681	697	696
NOV	713	686	700
DEC	703	721	721
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100	
		GUIDELINE = 5.0 (A3)	
JAN	.600	.600	1.000
FEB	.600	.600	.600
MAR	1.000	.800	.500
APR	.700	.700	.700
MAY	.700	.600	.600
JUN	.600	.700	.700
JUL	.600	.600	.700
AUG	.600	.800	.600
SEP	.500	.700	.600
OCT	.600	.700	.600
NOV	.600	.800	.600
DEC	.500	.600	.500
FLUORIDE (MG/L)		DET'N LIMIT = 0.01	
		GUIDELINE = 2.4 (A1)	
JAN	.060	.060	.060
FEB	.080	.060	.080
MAR	.040 <T	.040 <T	.040 <T
APR	.060	.060	.060
MAY	.060	.060	.060
JUN	.060	.060	.060
JUL	.080	.060	.060
AUG	.080	.080	.080
SEP	.060	.040 <T	.060
OCT	.060	.060	.060
NOV	.080	.060	.060
DEC	.080	.080	.080
HARDNESS (MG/L)		DET'N LIMIT = 0.5	
		GUIDELINE = 80-100 (A4)	
JAN	314.200	313.000	275.000
FEB	285.000	290.600	291.200
MAR	300.000	314.000	307.000
APR	288.000	304.000	298.000
MAY	282.000	285.000	285.400
JUN	289.000	298.000	298.000
JUL	284.000	289.000	283.000
AUG	291.400	303.600	296.700
SEP	289.900	295.100	295.200
OCT	281.600	290.900	291.300
NOV	297.000	303.000	298.000
DEC	299.500	310.800	303.800

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2		SITE 1		
		STANDING	FREE FLOW	
IONCAL (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	2.852	1.639	.180	
FEB	3.115	4.667	3.695	
MAR	2.057	1.904	.305	
APR	4.231	2.114	3.691	
MAY	5.118	4.932	5.163	
JUN	1.781	1.625	1.143	
JUL	1.082	.135	2.363	
AUG	.309	3.600	2.053	
SEP	3.585	4.494	4.556	
OCT	.008	1.718	2.171	
NOV	1.464	4.147	4.350	
DEC	1.678	3.292	1.842	
LANGELIERS INDEX (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	1.094	1.138	1.186	
FEB	.977	1.318	1.174	
MAR	1.082	1.178	1.146	
APR	1.022	1.114	1.170	
MAY	.802	.896	.877	
JUN	.884	.930	.933	
JUL	1.105	1.170	1.177	
AUG	.968	1.060	.968	
SEP	.979	1.031	1.091	
OCT	1.036	1.081	1.052	
NOV	1.292	.905	.975	
DEC	1.079	1.131	1.093	
MAGNESIUM (MG/L)		DET'N LIMIT = 0.10		GUIDELINE = 30 (F2)
JAN	22.400	21.200	17.100	
FEB	20.650	21.350	20.850	
MAR	21.400	21.900	21.400	
APR	21.500	21.500	21.200	
MAY	19.900	19.850	19.700	
JUN	20.700	20.800	20.800	
JUL	20.500	20.400	20.500	
AUG	20.000	20.400	20.250	
SEP	19.900	19.700	19.850	
OCT	19.750	19.600	20.450	
NOV	19.900	20.000	20.000	
DEC	20.900	20.950	20.100	
SODIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 200 (A4)
JAN	34.800	32.000	20.000	
FEB	29.000	30.800	30.100	
MAR	29.600	30.800	31.000	
APR	29.000	28.800	28.200	
MAY	26.800	27.800	28.000	
JUN	27.800	28.200	28.400	
JUL	27.800	28.400	28.000	
AUG	29.100	31.400	29.700	
SEP	28.100	28.100	28.100	
OCT	27.700	28.900	28.300	
NOV	27.800	28.200	27.800	
DEC	29.100	31.200	30.700	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)
JAN	.070	.070	.032	
FEB	.056	.064	.056	
MAR	.066	.052	.058	
APR	.072	.054	.066	
MAY	.042	.040	.036	
JUN	.050	.046	.038	
JUL	.062	.046	.028	
AUG	.056	.056	.040	
SEP	.038	.020	.008 <T	
OCT	.064	.010	BDL	
NOV	.054	.022	.018	
DEC	.066	.020	.002 <T	
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1 (A1)
JAN	.002 <T	.004 <T	.005	
FEB	BDL	.003 <T	.003 <T	
MAR	.004 <T	.005	.002 <T	
APR	BDL	.002 <T	.003 <T	
MAY	.001 <T	.002 <T	.002 <T	
JUN	BDL	.003 <T	.001 <T	
JUL	.005	.004 <T	.004 <T	
AUG	.001 <T	.003 <T	.002 <T	
SEP	.001 <T	.005	.004 <T	
OCT	.001 <T	.001 <T	BDL	
NOV	BDL	.002 <T	.002 <T	
DEC	BDL	.005	BDL	
TOTAL NITRATES (MG/L)		DET'N LIMIT = 0.005		GUIDELINE = 10 (A1)
JAN	BDL	.010 <T	.010 <T	
FEB	.005 <T	.010 <T	.015 <T	
MAR	BDL	.010 <T	BDL	
APR	BDL	BDL	.005 <T	
MAY	.085	.090	.090	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	.010 <T	
AUG	BDL	.005 <T	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	.005 <T	
DEC	BDL	BDL	BDL	
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02		GUIDELINE = N/A
JAN	.170	.210	.150	
FEB	.150	.150	.130	
MAR	.170	.140	.160	
APR	.140	.130	.140	
MAY	.120	.080 <T	.080 <T	
JUN	.110	.090 <T	.090 <T	
JUL	.110	.090 <T	.080 <T	
AUG	.130	.130	.090 <T	
SEP	.070 <T	.110	.020 <T	
OCT	.130	.110	.060 <T	
NOV	.100	.080 <T	.050 <T	
DEC	.070 <T	.080 <T	.050 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2		SITE 1	
		STANDING	FREE FLOW
PH (DMNSLESS)		DET'N LIMIT = N/A	
		GUIDELINE = 6.5-8.5(A4)	
JAN	8.300	8.330	8.410
FEB	8.240	8.560	8.410
MAR	8.310	8.380	8.360
APR	8.290	8.330	8.400
MAY	8.060	8.140	8.120
JUN	8.130	8.160	8.160
JUL	8.360	8.410	8.430
AUG	8.200	8.270	8.190
SEP	8.220	8.260	8.320
OCT	8.300	8.320	8.300
NOV	8.500	8.120	8.210
DEC	8.300	8.330	8.300
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005	
		GUIDELINE = N/A	
JAN	.001 <T	.	.
FEB	.001 <T	.	.
MAR	.001 <T	.	.
APR	.003	.	.
MAY	.001 <T	.	.
JUN	.001 <T	.	.
JUL	.002	.	.
AUG	.002 <T	.	.
SEP	BDL	.	.
OCT	.000 <T	.	.
NOV	.001 <T	.	.
DEC	.003	.	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002	
		GUIDELINE = .40 (F2)	
JAN	.004 <T	.	.
FEB	.012	.	.
MAR	.004 <T	.	.
APR	BDL	.	.
MAY	.004 <T	.	.
JUN	BDL	.	.
JUL	.004 <T	.	.
AUG	BDL	.	.
SEP	BDL	.	.
OCT	.005 <T	.	.
NOV	.003 <T	.	.
DEC	.003 <T	.	.
SULPHATE (MG/L)		DET'N LIMIT = .200	
		GUIDELINE = 500 (A3)	
JAN	25.960	26.730	29.930
FEB	23.620	24.140	23.360
MAR	24.370	24.030	24.060
APR	23.930	23.960	24.370
MAY	23.020	22.930	23.080
JUN	22.200	22.090	21.960
JUL	21.790	21.680	22.010
AUG	21.530	22.200	21.850
SEP	20.900	20.950	20.930
OCT	21.360	21.900	21.600
NOV	21.450	21.770	21.440
DEC	22.630	23.480	23.080

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990 -

RAW WELL DISTRIBUTION SYSTEM

RAW 2		SITE 1	
		STANDING	FREE FLOW
TURBIDITY (FTU)		DET'N LIMIT = 0.05	
		GUIDELINE = 1 (A1)	
JAN	1.110	.840	3.200
FEB	1.730	1.380	.940
MAR	1.740	.780	.930
APR	1.780	.160 <T	.450
MAY	1.500	.270	.720
JUN	1.450	.300	.300
JUL	1.230	.430	.490
AUG	.810	.600	.490
SEP	.750	.760	.300
OCT	.800	.250	.270
NOV	1.100	.300	.490
DEC	2.100	1.150	1.040

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

METALS
SILVER (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 50 (A1)

JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	BDL	BDL
APR	BDL	BDL	BDL
MAY	BDL	BDL	BDL
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	.060 <T
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

ALUMINUM (UG/L)

DET'N LIMIT = 0.10

GUIDELINE = 100 (A4)

JAN	5.100	6.900	7.700
FEB	8.000	11.000	9.700
MAR	9.600	14.000	11.000
APR	10.000	12.000	13.000
MAY	33.000	37.000	37.000
JUN	4.700	5.400	5.700
JUL	5.200	6.900	6.900
AUG	6.300	11.000	11.000
SEP	6.000	6.900	6.500
OCT	1.700	3.200	2.200
NOV	1.400	1.800	2.300
DEC	1.800	8.600	2.400

ARSENIC (UG/L)

DET'N LIMIT = 0.10

GUIDELINE = 25 (A1)

JAN	1.300	1.600	.990 <T
FEB	1.900	2.300	2.300
MAR	.380 <T	.190 <T	.340 <T
APR	.490 <T	.210 <T	.460 <T
MAY	.190 <T	.310 <T	.190 <T
JUN	.380 <T	.410 <T	.510 <T
JUL	.480 <T	.420 <T	.430 <T
AUG	BDL	.230 <T	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

BARIUM (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 1000 (A2)

JAN	210.000	210.000	210.000
FEB	170.000	170.000	170.000
MAR	170.000	180.000	170.000
APR	170.000	180.000	170.000
MAY	170.000	170.000	170.000
JUN	160.000	160.000	160.000
JUL	180.000	180.000	170.000
AUG	170.000	180.000	180.000
SEP	170.000	170.000	170.000
OCT	160.000	170.000	160.000
NOV	150.000	150.000	150.000
DEC	160.000	160.000	150.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2		SITE 1	
		STANDING	FREE FLOW
BORON (UG/L)		DET'N LIMIT = 2.00	
		GUIDELINE = 5000 (A1)	
JAN	21.000	21.000	12.000 <T
FEB	17.000 <T	17.000 <T	18.000 <T
MAR	35.000	51.000	25.000
APR	42.000	35.000	31.000
MAY	100.000	50.000	60.000
JUN	32.000	19.000 <T	21.000
JUL	30.000	33.000	30.000
AUG	41.000	35.000	36.000
SEP	19.000 <T	38.000	35.000
OCT	28.000	29.000	27.000
NOV	22.000	17.000 <T	19.000 <T
DEC	22.000	25.000	25.000
BERYLLIUM (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 6800 (D4)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	.090 <T	BDL
APR	BDL	BDL	BDL
MAY	.150 <T	BDL	.090 <T
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	.070 <T	BDL	BDL
SEP	BDL	.070 <T	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL
CADMIUM (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 5 (A1)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	.100 <T	BDL
APR	BDL	.140 <T	BDL
MAY	BDL	BDL	BDL
JUN	BDL	BDL	BDL
JUL	BDL	BDL	BDL
AUG	BDL	.080 <T	BDL
SEP	BDL	.100 <T	BDL
OCT	BDL	.150 <T	BDL
NOV	BDL	BDL	BDL
DEC	BDL	.150 <T	BDL
COBALT (UG/L)		DET'N LIMIT = 0.02	
		GUIDELINE = N/A	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	.060 <T	.030 <T	BDL
APR	.160 <T	.160 <T	.120 <T
MAY	.070 <T	.160 <T	.200 <T
JUN	.300 <T	.240 <T	.240 <T
JUL	BDL	BDL	.030 <T
AUG	BDL	.110 <T	.060 <T
SEP	.190 <T	.080 <T	.080 <T
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL DISTRIBUTION SYSTEM

RAW 2 SITE 1

STANDING FREE FLOW

CHROMIUM (UG/L) DET'N LIMIT = 0.50 GUIDELINE = 50 (A1)

JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	2.300 <T	4.400 <T	.690 <T
APR	3.400 <T	2.600 <T	1.500 <T
MAY	5.400	1.800 <T	2.400 <T
JUN	4.400 <T	BDL	.680 <T
JUL	2.300 <T	2.800 <T	2.300 <T
AUG	4.000 <T	2.200 <T	2.000 <T
SEP	BDL	3.500 <T	3.000 <T
OCT	4.300 <T	4.200 <T	4.100 <T
NOV	1.800 <T	BDL	.740 <T
DEC	2.500 <T	3.300 <T	3.000 <T

COPPER (UG/L) DET'N LIMIT = 0.50 GUIDELINE = 1000 (A3)

JAN	.510 <T	180.000	84.000
FEB	BDL	180.000	110.000
MAR	BDL	150.000	170.000
APR	BDL	66.000	130.000
MAY	1.500 <T	55.000	53.000
JUN	BDL	140.000	110.000
JUL	.580 <T	200.000	63.000
AUG	.960 <T	170.000	85.000
SEP	1.200 <T	120.000	55.000
OCT	BDL	55.000	30.000
NOV	.700 <T	35.000	34.000
DEC	.690 <T	38.000	19.000

IRON (UG/L) DET'N LIMIT = 6.00 GUIDELINE = 300 (A3)

JAN	160.000	170.000	340.000
FEB	130.000	130.000	91.000
MAR	150.000	100.000	98.000
APR	150.000	130.000	130.000
MAY	130.000	110.000	120.000
JUN	130.000	110.000	120.000
JUL	160.000	92.000	130.000
AUG	130.000	150.000	150.000
SEP	180.000	130.000	140.000
OCT	150.000	110.000	130.000
NOV	130.000	120.000	120.000
DEC	140.000	120.000	130.000

MERCURY (UG/L) DET'N LIMIT = 0.02 GUIDELINE = 1 (A1)

JAN	BDL	.	.
FEB	BDL	.	.
MAR	BDL	.	.
APR	BDL	.	.
MAY	BDL	.	.
JUN	BDL	.	.
JUL	BDL	.	.
AUG	BDL	.	.
SEP	BDL	.	.
OCT	BDL	.	.
NOV	.070 <T	.	.
DEC	BDL	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

MANGANESE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50 (A3)
JAN	11.000	19.000	37.000	
FEB	8.800	11.000	11.000	
MAR	9.300	14.000	13.000	
APR	9.500	10.000	12.000	
MAY	9.000	9.600	9.600	
JUN	8.700	11.000	10.000	
JUL	10.000	14.000	10.000	
AUG	9.400	11.000	10.000	
SEP	11.000	9.200	9.300	
OCT	9.500	9.100	8.500	
NOV	9.300	8.500	8.300	
DEC	9.700	9.200	8.400	
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A
JAN	.830	.790	.560	
FEB	.660	.600	.720	
MAR	.780	.800	.650	
APR	.730	.690	.630	
MAY	.650	.710	.620	
JUN	.690	.760	.730	
JUL	.650	.780	.690	
AUG	.620	.720	.710	
SEP	.660	.680	.770	
OCT	.650	.660	.660	
NOV	.680	.610	.650	
DEC	.610	.560	.580	
NICKEL (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (D3)
JAN	BDL	BDL	BDL	
FEB	BDL	BDL	BDL	
MAR	BDL	BDL	BDL	
APR	BDL	BDL	.280 <T	
MAY	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	
JUL	BDL	BDL	BDL	
AUG	BDL	49.000	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	1.300 <T	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
LEAD (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 10. (A1)
JAN	.120 <T	2.800	.500 <T	
FEB	.160 <T	4.400	.600	
MAR	.080 <T	1.800	.760	
APR	.100 <T	.590	.990	
MAY	.150 <T	.530	.590	
JUN	.210 <T	.920	.670	
JUL	.370 <T	1.600	.620	
AUG	.220 <T	2.500	1.100	
SEP	.230 <T	2.000	.830	
OCT	.230 <T	1.400	.510	
NOV	.220 <T	.680	.530	
DEC	.150 <T	1.500	.390 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 2		SITE 1	
		STANDING	FREE FLOW
ANTIMONY (UG/L)		DET'N LIMIT = 0.05	
		GUIDELINE = 146 (D4)	
JAN	.280 <T	.490 <T	.270 <T
FEB	.420 <T	.460 <T	.640
MAR	.310 <T	.340 <T	.410 <T
APR	.570	.350 <T	.420 <T
MAY	.170 <T	.180 <T	.180 <T
JUN	.370 <T	.520	.310 <T
JUL	.450 <T	.290 <T	.380 <T
AUG	.380 <T	.400 <T	.370 <T
SEP	.280 <T	.370 <T	.270 <T
OCT	.300 <T	.350 <T	.370 <T
NOV	.240 <T	.430 <T	.350 <T
DEC	.270 <T	.300 <T	.250 <T
SELENIUM (UG/L)		DET'N LIMIT = 1.00	
		GUIDELINE = 10 (A1)	
JAN	BDL	BDL	BDL
FEB	1.100 <T	1.100 <T	BDL
MAR	1.100 <T	BDL	BDL
APR	BDL	1.400 <T	1.900 <T
MAY	BDL	1.100 <T	1.200 <T
JUN	BDL	1.200 <T	1.200 <T
JUL	BDL	BDL	BDL
AUG	BDL	BDL	BDL
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	1.100 <T
STRONTIUM (UG/L)		DET'N LIMIT = 0.10	
		GUIDELINE = N/A	
JAN	340.000	330.000	300.000
FEB	270.000	280.000	270.000
MAR	280.000	280.000	270.000
APR	280.000	280.000	280.000
MAY	270.000	270.000	280.000
JUN	240.000	250.000	250.000
JUL	280.000	270.000	270.000
AUG	250.000	290.000	280.000
SEP	290.000	270.000	280.000
OCT	260.000	250.000	250.000
NOV	240.000	240.000	240.000
DEC	260.000	260.000	240.000
TITANIUM (UG/L)		DET'N LIMIT = 0.50	
		GUIDELINE = N/A	
JAN	11.000	12.000	14.000
FEB	13.000	15.000	14.000
MAR	15.000	16.000	18.000
APR	15.000	19.000	19.000
MAY	25.000	26.000	27.000
JUN	31.000	34.000	32.000
JUL	20.000	21.000	20.000
AUG	28.000	28.000	29.000
SEP	34.000	31.000	33.000
OCT	18.000	20.000	19.000
NOV	15.000	16.000	17.000
DEC	25.000	26.000	26.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WATER

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

URANIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)
JAN	.430 <T	.380 <T	.240 <T	
FEB	.350 <T	.380 <T	.380 <T	
MAR	.380 <T	.440 <T	.380 <T	
APR	.390 <T	.380 <T	.400 <T	
MAY	.390 <T	.360 <T	.430 <T	
JUN	.360 <T	.380 <T	.390 <T	
JUL	.360 <T	.370 <T	.360 <T	
AUG	.430 <T	.440 <T	.430 <T	
SEP	.380 <T	.430 <T	.410 <T	
OCT	.460 <T	.430 <T	.390 <T	
NOV	.440 <T	.440 <T	.470 <T	
DEC	.390 <T	.360 <T	.380 <T	
VANADIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A
JAN	.960	.990	.490 <T	
FEB	1.200	1.400	1.200	
MAR	.220 <T	.270 <T	.200 <T	
APR	.390 <T	.390 <T	.500 <T	
MAY	.110 <T	.150 <T	.170 <T	
JUN	.300 <T	.350 <T	.330 <T	
JUL	.110 <T	.180 <T	.190 <T	
AUG	BDL	.080 <T	.100 <T	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	.090 <T	BDL	.060 <T	
ZINC (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)
JAN	1.800 <T	33.000	5.800	
FEB	1.600 <T	38.000	13.000	
MAR	2.100	48.000	8.600	
APR	1.600 <T	4.900	10.000	
MAY	1.300 <T	5.200	4.300	
JUN	1.600 <T	9.500	6.300	
JUL	1.600 <T	17.000	4.100	
AUG	1.000 <T	14.000	5.200	
SEP	1.100 <T	10.000	3.500	
OCT	1.300 <T	20.000	3.000	
NOV	1.700 <T	5.300	3.500	
DEC	BDL	9.800	1.900 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WATER

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

PHENOLICS		DET'N LIMIT = .200		GUIDELINE = 2 (A4)	
PHENOLICS (UG/L)					
JAN	BDL	.	.		
FEB	BDL	.	.		
MAR	BDL	.	.		
APR	BDL	.	.		
MAY	.600 <T	.	.		
JUN	BDL	.	.		
JUL	BDL	.	.		
AUG	BDL	.	.		
SEP	.400 <T	.	.		
OCT	1.000 <T	.	.		
NOV	BDL	.	.		
DEC	.800 <T	.	.		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WATER

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

VOLATILES		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)
BENZENE (UG/L))			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	.100 <T	.	BDL	
APR	BDL	.	.050 <T	
MAY	BDL	.	BDL	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	
TOLUENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 24 (A3)
)			
JAN	BDL	.	.150 <T	
FEB	BDL	.	BDL	
MAR	BDL	.	BDL	
APR	BDL	.	BDL	
MAY	BDL	.	.050 <T	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 2.4 (A3)
)			
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	.100 <T	.	.150 <T	
APR	BDL	.	.150 <T	
MAY	.100 <T	.	.100 <T	
JUN	.100 <T	.	.150 <T	
JUL	BDL	.	.150 <T	
AUG	BDL	.	.200 <T	
SEP	BDL	.	.050 <T	
OCT	.050 <T	.	.100 <T	
NOV	.100 <T	.	.050 <T	
DEC	.050 <T	.	BDL	
O-XYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)
)			
JAN	BDL	.	.050 <T	
FEB	BDL	.	BDL	
MAR	BDL	.	BDL	
APR	BDL	.	BDL	
MAY	BDL	.	BDL	
JUN	BDL	.	BDL	
JUL	BDL	.	BDL	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	BDL	
DEC	BDL	.	BDL	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WATER

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

STYRENE (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 100 (D1)

JAN	BDL	.	BDL
FEB	.100 <T	.	BDL
MAR	.200 <T	.	.250 <T
APR	BDL	.	.150 <T
MAY	.100 <T	.	.150 <T
JUN	.200 <T	.	.250 <T
JUL	BDL	.	.200 <T
AUG	.100 <T	.	.350 <T
SEP	BDL	.	.100 <T
OCT	.050 <T	.	.100 <T
NOV	.150 <T	.	.100 <T
DEC	.100 <T	.	BDL

CHLOROFORM (UG/L)

DET'N LIMIT = 0.10

GUIDELINE = 350 (A1+)

JAN	BDL	.	2.600
FEB	BDL	.	.700 <T
MAR	BDL	.	.500 <T
APR	BDL	.	.500 <T
MAY	BDL	.	.600 <T
JUN	BDL	.	.600 <T
JUL	BDL	.	.800 <T
AUG	BDL	.	.800 <T
SEP	BDL	.	.800 <T
OCT	BDL	.	1.100
NOV	BDL	.	.900 <T
DEC	BDL	.	.800 <T

111, TRICHLOROETHANE (UG/L)

DET'N LIMIT = 0.02

GUIDELINE = 200 (D1)

JAN	BDL	.	BDL
FEB	BDL	.	BDL
MAR	BDL	.	BDL
APR	BDL	.	BDL
MAY	BDL	.	BDL
JUN	.140 <T	.	.100 <T
JUL	BDL	.	.040 <T
AUG	BDL	.	BDL
SEP	BDL	.	BDL
OCT	BDL	.	BDL
NOV	BDL	.	BDL
DEC	BDL	.	BDL

TRICHLOROETHYLENE (UG/L)

DET'N LIMIT = 0.10

GUIDELINE = 50 (A1)

JAN	BDL	.	6.400
FEB	BDL	.	BDL
MAR	BDL	.	BDL
APR	BDL	.	BDL
MAY	BDL	.	BDL
JUN	BDL	.	BDL
JUL	BDL	.	BDL
AUG	BDL	.	BDL
SEP	BDL	.	BDL
OCT	BDL	.	BDL
NOV	BDL	.	BDL
DEC	BDL	.	BDL

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM CENTENNIAL PARK WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 2

SITE 1

STANDING

FREE FLOW

DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
JAN	BDL	.700	
FEB	BDL	.650 <T	
MAR	BDL	.500 <T	
APR	BDL	.550	
MAY	BDL	.600 <T	
JUN	BDL	.600 <T	
JUL	BDL	.750 <T	
AUG	BDL	.650 <T	
SEP	BDL	.800 <T	
OCT	BDL	1.550	
NOV	BDL	1.100	
DEC	BDL	1.050	
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
JAN	BDL	.300 <T	
FEB	BDL	.500 <T	
MAR	BDL	.400 <T	
APR	BDL	.400 <T	
MAY	BDL	.400 <T	
JUN	BDL	.300 <T	
JUL	BDL	.500 <T	
AUG	BDL	.500 <T	
SEP	BDL	.600 <T	
OCT	BDL	1.700	
NOV	BDL	.800 <T	
DEC	BDL	.800 <T	
BROMOFORM (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)
JAN	BDL	BDL	
FEB	BDL	.200 <T	
MAR	BDL	BDL	
APR	BDL	BDL	
MAY	BDL	BDL	
JUN	BDL	BDL	
JUL	BDL	BDL	
AUG	BDL	BDL	
SEP	BDL	.200 <T	
OCT	BDL	1.400 <T	
NOV	BDL	.400 <T	
DEC	BDL	.400 <T	
TOTAL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
JAN	BDL	3.500 <T	
FEB	BDL	2.050 <T	
MAR	BDL	1.400 <T	
APR	BDL	1.450 <T	
MAY	BDL	1.600 <T	
JUN	BDL	1.500 <T	
JUL	BDL	2.050 <T	
AUG	BDL	1.850 <T	
SEP	BDL	2.450 <T	
OCT	BDL	5.850	
NOV	BDL	3.150 <T	
DEC	BDL	3.150 <T	

THE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

BACTERIOLOGICAL
FECAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 0 (A1)

JAN	0
FEB	BDL
MAR	0
APR	0
MAY	0
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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STANDRD PLATE CNT MF (COUNT/ML)

DET'N LIMIT = 0

GUIDELINE = 500/ML (A3)

JAN	.
FEB	.
APR	.
AUG	.
SEP	.
OCT	.
NOV	.
DEC	.

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4 <=>
109
2 <=>
6 <=>
0 <=>
1 <=>
2 <=>
2 <=>

TOTAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 5/100ML(A1)

JAN	BDL
FEB	BDL
MAR	BDL
APR	BDL
MAY	BDL
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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T COLIFORM BCKGRD MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = N/A

JAN	BDL
FEB	BDL
MAR	BDL
APR	BDL
MAY	BDL
JUN	0
JUL	0
AUG	0
SEP	0
OCT	0
NOV	0
DEC	0

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TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A
JAN	.	.000	.000	
FEB	.	.000	.000	
APR	.	.000	.000	
AUG	.	.000	.000	
SEP	.	.000	.000	
OCT	.	.000	.000	
NOV	.	.000	.000	
DEC	.	.000	.000	

FLD CHLORINE FREE (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A
JAN	.	.100	.100	
FEB	.	.100	.100	
APR	.	.100	.100	
AUG	.	.100	.100	
SEP	.	.100	.100	
OCT	.	.100	.100	
NOV	.	.100	.100	
DEC	.	.100	.100	

FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A
JAN	.	.100	.100	
FEB	.	.100	.100	
APR	.	.100	.100	
AUG	.	.100	.100	
SEP	.	.100	.100	
OCT	.	.100	.100	
NOV	.	.100	.100	
DEC	.	.100	.100	

FLD PH (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
JAN	7.400	7.600	7.600	
FEB	7.400	7.600	7.400	
MAR	7.500	.	.	
APR	7.500	7.600	7.600	
MAY	7.400	.	.	
JUN	7.400	.	.	
JUL	7.300	.	.	
AUG	7.400	7.600	7.400	
SEP	7.400	7.500	7.500	
OCT	7.500	7.400	7.400	
NOV	7.400	7.400	7.400	
DEC	7.500	7.600	7.400	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW	
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A		GUIDELINE = 15 (A3)
JAN	8.000	13.000	4.000	
FEB	8.000	13.000	3.900	
MAR	7.500	.	.	
APR	7.800	12.000	5.500	
MAY	8.300	.	.	
JUN	8.900	.	.	
JUL	8.000	.	.	
AUG	9.000	15.000	8.000	
SEP	8.700	.	.	
OCT	8.000	16.000	9.500	
NOV	7.500	10.500	8.000	
DEC	8.000	15.000	8.000	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

CHEMISTRY (LAB)				DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A3)
ALKALINITY (MG/L)					
JAN	254.800	263.600	255.400		
FEB	249.500	255.000	250.200		
MAR	247.900	.	.		
APR	242.100	261.800	249.600		
MAY	205.700	.	.		
JUN	240.000	.	.		
JUL	213.900	.	.		
AUG	262.100	264.600	261.400		
SEP	253.100	257.000	256.600		
OCT	244.700	243.400	226.600		
NOV	263.900	261.100	261.000		
DEC	241.600	263.500	254.900		
CALCIUM (MG/L)				DET'N LIMIT = 0.2	GUIDELINE = 100 (F2)
JAN	87.600	93.400	91.400		
FEB	86.400	84.200	83.000		
MAR	83.400	.	.		
APR	84.000	90.600	85.600		
MAY	80.700	.	.		
JUN	86.100	.	.		
JUL	75.800	.	.		
AUG	94.600	105.300	102.900		
SEP	98.800	100.100	100.400		
OCT	88.200	84.700	74.400		
NOV	104.000	98.800	98.800		
DEC	85.600	91.400	82.700		
CHLORIDE (MG/L)				DET'N LIMIT = 0.2	GUIDELINE = 250 (A3)
JAN	26.000	26.100	26.000		
FEB	26.300	26.800	26.200		
MAR	26.700	.	.		
APR	26.400	23.800	26.000		
MAY	32.800	.	.		
JUN	33.900	.	.		
JUL	34.100	.	.		
AUG	34.000	34.700	34.400		
SEP	33.700	33.900	34.000		
OCT	34.200	22.300	22.200		
NOV	34.600	34.000	33.500		
DEC	31.100	23.600	23.800		
COLOUR (HZU)				DET'N LIMIT = 0.5	GUIDELINE = 5 (A3)
JAN	.500 <T	BDL	.500		
FEB	BDL	BDL	.500 <T		
MAR	.500 <T	.	.		
APR	BDL	BDL	BDL		
MAY	.500 <T	.	.		
JUN	.500 <T	.	.		
JUL	BDL	.	.		
AUG	BDL	BDL	BDL		
SEP	.500 <T	.500 <T	.500 <T		
OCT	BDL	.500 <T	.500 <T		
NOV	BDL	BDL	BDL		
DEC	.500 <T	.500 <T	.500 <T		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL		DISTRIBUTION SYSTEM	
RAW 3		SITE 1	
		STANDING	FREE FLOW
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.	
		GUIDELINE = 400 (F2)	
JAN	594	597	598
FEB	581	590	585
MAR	588	.	.
APR	575	579	582
MAY	632	.	.
JUN	647	.	.
JUL	585	.	.
AUG	648	646	643
SEP	609	611	612
OCT	604	587	539
NOV	659	648	649
DEC	638	573	572
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100	
		GUIDELINE = 5.0 (A3)	
JAN	.500	.500	.300 <T
FEB	.600	.600	.500
MAR	.400 <T	.	.
APR	.700	.700	.700
MAY	.600	.	.
JUN	.700	.	.
JUL	.600	.	.
AUG	.600	.600	.700
SEP	.600	.600	.500
OCT	.600	.600	.700
NOV	.600	.500	.600
DEC	.600	.500	.500
FLUORIDE (MG/L)		DET'N LIMIT = 0.01	
		GUIDELINE = 2.4 (A1)	
JAN	.060	.060	.060
FEB	.060	.060	.060
MAR	.040 <T	.	.
APR	.060	.060	.060
MAY	.060	.	.
JUN	.060	.	.
JUL	.060	.	.
AUG	.060	.060	.060
SEP	.060	.040 <T	.040 <T
OCT	.040 <T	.060	.060
NOV	.060	.020 <T	.040 <T
DEC	.080	.060	.060
HARDNESS (MG/L)		DET'N LIMIT = 0.5	
		GUIDELINE = 80-100 (A4)	
JAN	286.000	301.000	295.000
FEB	282.100	276.400	273.900
MAR	275.000	.	.
APR	276.400	296.000	282.100
MAY	268.600	.	.
JUN	285.000	.	.
JUL	257.000	.	.
AUG	306.200	335.000	327.400
SEP	314.700	318.000	318.600
OCT	290.700	281.100	256.100
NOV	330.000	317.200	316.600
DEC	282.000	299.500	276.900

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

IONCAL (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	1.356	.864	1.487	
FEB	1.667	4.972	4.443	
MAR	4.272	.	.	
APR	1.553	.819	1.643	
MAY	4.580	.	.	
JUN	3.698	.	.	
JUL	4.181	.	.	
AUG	3.931	3.486	2.267	
SEP	4.348	3.946	4.413	
OCT	3.989	2.806	.200	
NOV	2.201	.339	.422	
DEC	4.814	2.055	3.562	
LANGELIERS INDEX (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A
JAN	1.149	1.211	1.118	
FEB	1.095	1.292	1.158	
MAR	1.176	.	.	
APR	1.150	1.337	1.221	
MAY	.827	.	.	
JUN	.942	.	.	
JUL	1.031	.	.	
AUG	1.071	1.431	1.336	
SEP	1.267	1.329	1.289	
OCT	1.203	1.135	.872	
NOV	1.464	1.178	1.138	
DEC	1.112	1.344	1.286	
MAGNESIUM (MG/L)		DET'N LIMIT = 0.10		GUIDELINE = 30 (F2)
JAN	16.400	16.500	16.300	
FEB	16.150	16.050	16.150	
MAR	16.300	.	.	
APR	16.200	16.900	16.600	
MAY	16.250	.	.	
JUN	17.200	.	.	
JUL	16.500	.	.	
AUG	17.050	17.500	17.150	
SEP	16.550	16.550	16.500	
OCT	17.100	16.900	17.050	
NOV	17.100	17.150	16.950	
DEC	16.400	17.350	17.150	
SODIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 200 (A4)
JAN	14.200	14.600	14.200	
FEB	13.200	14.300	13.500	
MAR	12.400	.	.	
APR	12.600	12.200	12.800	
MAY	13.700	.	.	
JUN	12.400	.	.	
JUL	12.800	.	.	
AUG	12.800	13.200	12.800	
SEP	14.500	14.600	14.900	
OCT	13.600	13.200	13.300	
NOV	12.400	12.500	12.500	
DEC	14.400	14.400	12.900	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3		SITE 1	
		STANDING	FREE FLOW
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	
		GUIDELINE = 0.05 (F2)	
JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	.002	.	.
APR	BDL	.014	.010
MAY	BDL	.	.
JUN	BDL	.	.
JUL	BDL	.	.
AUG	BDL	.034	.008 <T
SEP	BDL	BDL	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	.004 <T
DEC	BDL	BDL	BDL
NITRITE (MG/L)		DET'N LIMIT = 0.001	
		GUIDELINE = 1 (A1)	
JAN	.003 <T	.002 <T	.001 <T
FEB	.001 <T	.001 <T	.006
MAR	.005	.	.
APR	.001 <T	.001 <T	.003 <T
MAY	.003 <T	.	.
JUN	.002 <T	.	.
JUL	.005	.	.
AUG	.002 <T	.001 <T	.001 <T
SEP	.003 <T	.002 <T	.002 <T
OCT	.001 <T	.001 <T	BDL
NOV	.003 <T	.001 <T	.002 <T
DEC	BDL	BDL	BDL
TOTAL NITRATES (MG/L)		DET'N LIMIT = 0.005	
		GUIDELINE = 10 (A1)	
JAN	3.440	3.400	3.370
FEB	3.330	3.410	3.320
MAR	3.410	.	.
APR	3.300	3.130	.130
MAY	4.030	.	.
JUN	4.730	.	.
JUL	4.320	.	.
AUG	4.800	4.940	4.830
SEP	3.710	3.790	3.750
OCT	5.500	2.770	2.760
NOV	4.690	4.770	4.780
DEC	6.050	2.830	2.850
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02	
		GUIDELINE = N/A	
JAN	.100	.100	.070 <T
FEB	.090 <T	.110	.140
MAR	.080 <T	.	.
APR	.240	.140	.100
MAY	.080 <T	.	.
JUN	.080 <T	.	.
JUL	.080 <T	.	.
AUG	.120	.140	.080 <T
SEP	.060 <T	.050 <T	.030 <T
OCT	.090 <T	.080 <T	.080 <T
NOV	.080 <T	.080 <T	.060 <T
DEC	.080 <T	.060 <T	.050 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

PH (DMNSLESS)

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

JAN	8.270	8.290	8.220
FEB	8.230	8.430	8.310
MAR	8.330	.	.
APR	8.310	8.430	8.360
MAY	8.080	.	.
JUN	8.100	.	.
JUL	8.290	.	.
AUG	8.150	8.460	8.380
SEP	8.340	8.390	8.350
OCT	8.340	8.290	8.110
NOV	8.500	8.240	8.200
DEC	8.270	8.430	8.430

PHOSPHORUS FIL REACT (MG/L)

DET'N LIMIT = 0.0005

GUIDELINE = N/A

JAN	BDL	.	.
FEB	BDL	.	.
MAR	BDL	.	.
APR	.001 <T	.	.
MAY	BDL	.	.
JUN	.001 <T	.	.
JUL	.000 <T	.	.
AUG	.000 <T	.	.
SEP	BDL	.	.
OCT	BDL	.	.
NOV	.001 <T	.	.
DEC	.000 <T	.	.

PHOSPHORUS TOTAL (MG/L)

DET'N LIMIT = 0.002

GUIDELINE = .40 (F2)

JAN	BDL	.	.
FEB	.005 <T	.	.
MAR	BDL	.	.
APR	.004 <T	.	.
MAY	.002 <T	.	.
JUN	BDL	.	.
JUL	BDL	.	.
AUG	BDL	.	.
SEP	BDL	.	.
OCT	.003 <T	.	.
NOV	BDL	.	.
DEC	.002 <T	.	.

SULPHATE (MG/L)

DET'N LIMIT = .200

GUIDELINE = 500 (A3)

JAN	16.910	16.730	16.580
FEB	16.870	16.920	16.780
MAR	16.730	.	.
APR	16.670	17.640	17.400
MAY	17.990	.	.
JUN	18.800	.	.
JUL	18.670	.	.
AUG	19.330	19.430	19.450
SEP	17.250	17.380	17.430
OCT	19.500	15.850	15.860
NOV	18.980	18.720	18.960
DEC	19.660	16.620	16.590

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW		
TURBIDITY (FTU)		DET'N LIMIT = 0.05		GUIDELINE = 1 (A1)	
JAN	3.400	.730	.880		
FEB	.840	.710	.330		
MAR	.510	.	.		
APR	.190 <T	.250 <T	.130 <T		
MAY	.160 <T	.	.		
JUN	.200 <T	.	.		
JUL	.560	.	.		
AUG	.500	.500	.390		
SEP	.540	.140 <T	.160 <T		
OCT	.140 <T	.120 <T	.240 <T		
NOV	.110 <T	.140 <T	.530		
DEC	1.150	.190	.360		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

METALS		DET'N LIMIT = 0.10		GUIDELINE = 100 (A4)
ALUMINUM (UG/L)				
JAN	5.500	7.000	7.100	
FEB	8.200	9.800	9.600	
MAR	9.800	.	.	
APR	10.000	12.000	17.000	
MAY	31.000	.	.	
JUN	4.500	.	.	
JUL	6.300	.	.	
AUG	8.100	10.000	10.000	
SEP	5.600	6.100	6.100	
OCT	1.700	3.000	4.500	
NOV	1.400	1.800	1.800	
DEC	3.000	2.700	2.400	
ARSENIC (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 25 (A1)
JAN	.470 <T	.670 <T	.640 <T	
FEB	1.100	.890 <T	.950 <T	
MAR	.180 <T	.	.	
APR	.260 <T	.170 <T	.300 <T	
MAY	.220 <T	.	.	
JUN	.480 <T	.	.	
JUL	.230 <T	.	.	
AUG	.160 <T	.130 <T	.120 <T	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	.360 <T	.480 <T	.450 <T	
DEC	.120 <T	BDL	.200 <T	
BARIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)
JAN	78.000	79.000	74.000	
FEB	67.000	68.000	67.000	
MAR	67.000	.	.	
APR	69.000	67.000	67.000	
MAY	75.000	.	.	
JUN	72.000	.	.	
JUL	75.000	.	.	
AUG	77.000	79.000	76.000	
SEP	74.000	67.000	63.000	
OCT	74.000	77.000	75.000	
NOV	70.000	70.000	71.000	
DEC	82.000	80.000	69.000	
BORON (UG/L)		DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)
JAN	11.000 <T	10.000 <T	9.300 <T	
FEB	10.000 <T	11.000 <T	9.900 <T	
MAR	9.600 <T	.	.	
APR	16.000 <T	40.000	28.000	
MAY	28.000	.	.	
JUN	10.000 <T	.	.	
JUL	30.000	.	.	
AUG	27.000	24.000	25.000	
SEP	21.000	29.000	29.000	
OCT	8.000 <T	23.000	24.000	
NOV	12.000 <T	13.000 <T	12.000 <T	
DEC	7.100 <T	14.000 <T	17.000 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

BERYLLIUM (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 6800 (D4)

JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	.	.
APR	BDL	BDL	BDL
MAY	BDL	.	.
JUN	BDL	.	.
JUL	.070 <T	.	.
AUG	.060 <T	.060 <T	BDL
SEP	.080 <T	BDL	.090 <T
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

CADMIUM (UG/L)

DET'N LIMIT = 0.05

GUIDELINE = 5 (A1)

JAN	BDL	.100 <T	BDL
FEB	BDL	BDL	BDL
MAR	BDL	.	.
APR	BDL	.060 <T	BDL
MAY	BDL	.	.
JUN	BDL	.	.
JUL	BDL	.	.
AUG	BDL	BDL	BDL
SEP	BDL	.060 <T	BDL
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

COBALT (UG/L)

DET'N LIMIT = 0.02

GUIDELINE = N/A

JAN	BDL	BDL	BDL
FEB	BDL	3.100	1.600
MAR	.050 <T	.	.
APR	.030 <T	2.400	.140 <T
MAY	.080 <T	.	.
JUN	.140 <T	.	.
JUL	BDL	.	.
AUG	BDL	.070 <T	BDL
SEP	BDL	.120 <T	.140 <T
OCT	BDL	BDL	BDL
NOV	BDL	BDL	BDL
DEC	BDL	BDL	BDL

CHROMIUM (UG/L)

DET'N LIMIT = 0.50

GUIDELINE = 50 (A1)

JAN	BDL	BDL	BDL
FEB	BDL	BDL	BDL
MAR	BDL	.	.
APR	.980 <T	4.600 <T	3.000 <T
MAY	1.700 <T	.	.
JUN	1.200 <T	.	.
JUL	4.600 <T	.	.
AUG	3.200 <T	2.800 <T	2.900 <T
SEP	2.700 <T	4.100 <T	4.400 <T
OCT	1.300 <T	5.400	5.600
NOV	2.600 <T	2.500 <T	2.500 <T
DEC	.770 <T	1.800 <T	3.100 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

COPPER (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)
JAN	1.300 <T	440.000	41.000	
FEB	1.200 <T	350.000	43.000	
MAR	1.200 <T	.	.	
APR	1.200 <T	330.000	36.000	
MAY	1.100 <T	.	.	
JUN	1.500 <T	.	.	
JUL	1.200 <T	.	.	
AUG	.930 <T	400.000	45.000	
SEP	.900 <T	170.000	35.000	
OCT	1.000 <T	330.000	46.000	
NOV	.760 <T	91.000	39.000	
DEC	1.400 <T	280.000	45.000	
IRON (UG/L)		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)
JAN	11.000 <T	BDL	7.600 <T	
FEB	BDL	BDL	BDL	
MAR	9.700 <T	.	.	
APR	BDL	BDL	BDL	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	8.600 <T	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	12.000 <T	
NOV	BDL	BDL	BDL	
DEC	17.000 <T	BDL	BDL	
MERCURY (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = 1 (A1)
JAN	BDL	.	.	
FEB	BDL	.	.	
MAR	BDL	.	.	
APR	BDL	.	.	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	.040 <T	.	.	
AUG	BDL	.	.	
SEP	BDL	.	.	
OCT	.070 <T	.	.	
NOV	BDL	.	.	
DEC	BDL	.	.	
MANGANESE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50 (A3)
JAN	5.900	5.100	4.000	
FEB	4.700	4.100	3.600	
MAR	5.300	.	.	
APR	5.400	5.000	4.400	
MAY	3.600	.	.	
JUN	1.800	.	.	
JUL	.530	.	.	
AUG	.260 <T	.900	.120 <T	
SEP	.400 <T	.350 <T	.270 <T	
OCT	.240 <T	7.000	6.000	
NOV	.170 <T	.180 <T	.120 <T	
DEC	3.500	5.600	4.600	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW	
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A
JAN	.400 <T	.380 <T	.390 <T	
FEB	.350 <T	.310 <T	.290 <T	
MAR	.360 <T	.	.	
APR	.340 <T	.360 <T	.290 <T	
MAY	.220 <T	.	.	
JUN	.230 <T	.	.	
JUL	.210 <T	.	.	
AUG	.230 <T	.240 <T	.180 <T	
SEP	.270 <T	.280 <T	.230 <T	
OCT	.150 <T	.470 <T	.440 <T	
NOV	.240 <T	.180 <T	.200 <T	
DEC	.120 <T	.410 <T	.400 <T	
NICKEL (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (D3)
JAN	BDL	BDL	BDL	
FEB	BDL	12.000	BDL	
MAR	BDL	.	.	
APR	BDL	150.000	BDL	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	3.100	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	
LEAD (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 10. (A1)
JAN	.700	18.000	.580	
FEB	.470 <T	3.100	.410 <T	
MAR	.390 <T	.	.	
APR	.320 <T	4.700	.410 <T	
MAY	.310 <T	.	.	
JUN	.250 <T	.	.	
JUL	.150 <T	.	.	
AUG	.990	8.800	.620	
SEP	.210 <T	2.800	.460 <T	
OCT	.260 <T	3.200	.510	
NOV	.110 <T	2.400	.490 <T	
DEC	.200 <T	3.200	.490 <T	
ANTIMONY (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 146 (D4)
JAN	.370 <T	.380 <T	.300 <T	
FEB	.430 <T	14.000	7.800	
MAR	.290 <T	.	.	
APR	.380 <T	8.200	.340 <T	
MAY	.280 <T	.	.	
JUN	.320 <T	.	.	
JUL	.230 <T	.	.	
AUG	.270 <T	.510	.120 <T	
SEP	.250 <T	.230 <T	.140 <T	
OCT	.340 <T	.410 <T	.370 <T	
NOV	.380 <T	.380 <T	.310 <T	
DEC	.490 <T	.370 <T	.280 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

SELENIUM (UG/L)		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)
JAN	BDL	BDL	BDL	
FEB	BDL	1.100 <T	BDL	
MAR	BDL	.	.	
APR	1.600 <T	1.700 <T	BDL	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	BDL	BDL	
SEP	BDL	BDL	BDL	
OCT	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	
DEC	BDL	1.100 <T	BDL	
STRONTIUM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = N/A
JAN	200.000	200.000	200.000	
FEB	180.000	170.000	170.000	
MAR	180.000	.	.	
APR	180.000	180.000	180.000	
MAY	200.000	.	.	
JUN	170.000	.	.	
JUL	180.000	.	.	
AUG	190.000	190.000	190.000	
SEP	190.000	170.000	170.000	
OCT	180.000	200.000	190.000	
NOV	180.000	180.000	180.000	
DEC	200.000	200.000	190.000	
TITANIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = N/A
JAN	11.000	13.000	12.000	
FEB	15.000	15.000	15.000	
MAR	16.000	.	.	
APR	16.000	17.000	18.000	
MAY	27.000	.	.	
JUN	30.000	.	.	
JUL	19.000	.	.	
AUG	25.000	28.000	27.000	
SEP	28.000	28.000	26.000	
OCT	18.000	22.000	21.000	
NOV	16.000	17.000	17.000	
DEC	27.000	28.000	23.000	
URANIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)
JAN	.960	1.000	.930	
FEB	.900	.880	.860	
MAR	.850	.	.	
APR	.880	1.100	.970	
MAY	.890	.	.	
JUN	.810	.	.	
JUL	.940	.	.	
AUG	.800	.740	.780	
SEP	.900	.810	.820	
OCT	.710	1.400	1.500	
NOV	.850	.850	.880	
DEC	.590	1.400	1.300	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW	
VANADIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A
JAN	.800	.770	.750	
FEB	.780	.830	.860	
MAR	.490 <T	.	.	
APR	.580	.480 <T	.490 <T	
MAY	.490 <T	.	.	
JUN	.540	.	.	
JUL	.540	.	.	
AUG	.500 <T	.490 <T	.460 <T	
SEP	.350 <T	.300 <T	.290 <T	
OCT	.360 <T	.390 <T	.370 <T	
NOV	.330 <T	.350 <T	.390 <T	
DEC	.430 <T	.390 <T	.280 <T	
ZINC (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)
JAN	.980 <T	14.000	1.300 <T	
FEB	1.200 <T	10.000	1.500 <T	
MAR	1.500 <T	.	.	
APR	1.100 <T	16.000	1.400 <T	
MAY	1.500 <T	.	.	
JUN	1.400 <T	.	.	
JUL	.980 <T	.	.	
AUG	.980 <T	11.000	1.700 <T	
SEP	.950 <T	6.700	1.100 <T	
OCT	1.300 <T	10.000	1.200 <T	
NOV	1.700 <T	11.000	2.200	
DEC	.690 <T	9.400	.620 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

PHENOLICS		PHENOLICS		DET'N LIMIT = .200	GUIDELINE = 2 (A4)
PHENOLICS (UG/L)				
JAN	BDL	.	.		
FEB	BDL	.	.		
MAR	BDL	.	.		
APR	BDL	.	.		
MAY	BDL	.	.		
JUN	!NR	.	.		
JUL	BDL	.	.		
AUG	BDL	.	.		
SEP	BDL	.	.		
OCT	BDL	.	.		
NOV	BDL	.	.		
DEC	.800 <T	.	.		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

STANDING

FREE FLOW

VOLATILES			
BENZENE (UG/L)	)	DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
JAN	BDL	BDL	
FEB	BDL	BDL	
MAR	.100 <T	.	
APR	BDL	BDL	
MAY	BDL	.	
JUN	BDL	.	
JUL	BDL	.	
AUG	BDL	BDL	
SEP	BDL	BDL	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
ETHYLBENZENE (UG/L)	)	DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
JAN	BDL	BDL	
FEB	BDL	BDL	
MAR	.150 <T	.	
APR	.050 <T	BDL	
MAY	BDL	.	
JUN	.100 <T	.	
JUL	BDL	.	
AUG	.100 <T	BDL	
SEP	BDL	BDL	
OCT	.050 <T	BDL	
NOV	.100 <T	.050 <T	
DEC	BDL	.100 <T	
STYRENE (UG/L)	)	DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)
JAN	BDL	BDL	
FEB	.050 <T	.050 <T	
MAR	.200 <T	.	
APR	BDL	BDL	
MAY	BDL	.	
JUN	.200 <T	.	
JUL	BDL	.	
AUG	.150 <T	BDL	
SEP	.050 <T	BDL	
OCT	.100 <T	BDL	
NOV	.150 <T	BDL	
DEC	.050 <T	.100 <T	
CHLOROFORM (UG/L)	)	DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
JAN	BDL	1.500	
FEB	BDL	1.700	
MAR	BDL	.	
APR	BDL	.800 <T	
MAY	BDL	.	
JUN	BDL	.	
JUL	BDL	.	
AUG	BDL	1.000 <T	
SEP	BDL	1.600	
OCT	BDL	.800 <T	
NOV	BDL	1.200	
DEC	BDL	1.500	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW	
111, TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = 200 (D1)
JAN	BDL	.	BDL	
FEB	BDL	.	BDL	
MAR	BDL	.	.	
APR	.020 <T	.	BDL	
MAY	BDL	.	.	
JUN	.120 <T	.	.	
JUL	BDL	.	.	
AUG	BDL	.	BDL	
SEP	BDL	.	BDL	
OCT	BDL	.	BDL	
NOV	BDL	.	.040 <T	
DEC	BDL	.	BDL	
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)
JAN	BDL	.	1.650	
FEB	BDL	.	1.700	
MAR	BDL	.	.	
APR	BDL	.	.800	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	1.850	
SEP	BDL	.	2.450	
OCT	BDL	.	.850	
NOV	BDL	.	1.950	
DEC	BDL	.	1.600	
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)
JAN	BDL	.	2.300	
FEB	BDL	.	1.400	
MAR	BDL	.	.	
APR	BDL	.	.700 <T	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	2.500	
SEP	BDL	.	2.600	
OCT	BDL	.	.600 <T	
NOV	BDL	.	2.200	
DEC	BDL	.	1.100	
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)
JAN	BDL	.	.400 <T	
FEB	BDL	.	.400 <T	
MAR	BDL	.	.	
APR	BDL	.	BDL	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	.800 <T	
SEP	BDL	.	1.000 <T	
OCT	BDL	.	BDL	
NOV	BDL	.	.800 <T	
DEC	BDL	.	.200 <T	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM JOHNSON ST WELL, BARRIE 1990

RAW WELL

DISTRIBUTION SYSTEM

RAW 3

SITE 1

		STANDING	FREE FLOW	
TOTAL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
JAN	BDL	.	5.800	
FEB	BDL	.	5.300	
MAR	BDL	.	.	
APR	BDL	.	2.300 <T	
MAY	BDL	.	.	
JUN	BDL	.	.	
JUL	BDL	.	.	
AUG	BDL	.	6.150	
SEP	BDL	.	7.600	
OCT	BDL	.	2.300 <T	
NOV	BDL	.	6.150	
DEC	BDL	.	4.450 <T	

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A3)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.2	30-500 (A3)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.2	100 (F2)
CHLORIDE	MG/L	0.2	250 (A3)
COLOUR	TCU	0.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.0	400 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.1	5.0 (A3)
FLUORIDE	MG/L	0.01	2.4 (A1)
HARDNESS	MG/L	0.5	80-100 (A4)
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.1	30.0 (F2)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
SODIUM	MG/L	0.2	200 (A4)
SULPHATE	MG/L	0.2	500 (A3)
TOTAL NITRATES	MG/L	0.005	10.0 (A1)
TURBIDITY	FTU	0.05	1.0 (A1)
CHLOROAROMATICS			
123 TRICHLOROBENZENE	NG/L	5.0	N/A
1234 TETRACHLOROBENZENE	NG/L	1.0	N/A
1235 TETRACHLOROBENZENE	NG/L	1.0	N/A
124 TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1245-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
135 TRICHLOROBENZENE	NG/L	5.0	N/A
236 TRICHLOROTOLUENE	NG/L	5.0	N/A
245 TRICHLOROTOLUENE	NG/L	5.0	N/A
26A TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
234 TRICHLOROPHENOL	NG/L	100.0	N/A
2345 TETRACHLOROPHENOL	NG/L	20.0	N/A
2356 TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
245 TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
246 TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	50 (A1)
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
PAH			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10.0 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000.0 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DES ETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEx)	NG/L	100.0	10000 (A2)
O,P-DDD	NG/L	5.0	10 (I)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	N/A
O,P-DDT	NG/L	5.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PPDDE	NG/L	1.0	30000 (A1)
PPDDT	NG/L	5.0	30000 (A1)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
D-ETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	2 (A4)
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.	18000 (B3)
BUTYLATE (SUTAN)	NG/L	2000.	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.	90000 (A1)
CARBOFURAN	NG/L	2000.	90000 (A1)
CHLORPYRIFOS (DURBAN)	NG/L	20.	N/A
CICP (CHLORPROPHAM)	NG/L	2000.	350000 (G)
DIALATE	NG/L	2000.	N/A
DIAZINON	NG/L	20.	20000 (A1)
DICAMBA	NG/L	50.	120000 (A1)
DICHLOROVOS	NG/L	20.	N/A
EPTAM	NG/L	2000.	N/A
ETHION	NG/L	20.	35000 (G)
IPC	NG/L	2000.	N/A
MALATHION	NG/L	20.	190000 (A1)
METHYL PARATHION	NG/L	50.	7000 (B3)
METHYLTRITHION	NG/L	20.	N/A
MEVINPHOS	NG/L	20.	N/A
PARATHION	NG/L	20.	50000 (A1)
PHORATE (THIMET)	NG/L	20.	2000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.	140000 (D3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
SILVEX (2,4,5-TP)	NG/L	20.	10000 (A1)
VOLATILES			
1,1 DICHLOROETHANE	UG/L	0.10	N/A
1,1 DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2 DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2 DICHLOROETHANE	UG/L	0.05	5 (A1)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
1,2 DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3 DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4 DICHLOROBENZENE	UG/L	0.10	5 (A1)
111, TRICHLOROETHANE	UG/L	0.02	200 (D1)
112 TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1122 TETRACHLOROETHANE	UG/L	0.05	0.17(D4)
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	5 (D1)
TRANS 1,2 DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1990, 76 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment (MOE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake,

discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH.

These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated

water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE INFORMATION

BENZENE (B2001P)

VOLATILES

CLASS: HEALTH METHOD: POCODO UNIT: µg/L

SOURCE	FROM	TO	METHOD	GUIDELINE	UNIT	NOTE
CAL C	85/01			0.700	µg/L	AL
CDWG C	87/01			5.000	µg/L	MAC
EPA C	87/07			5.000	µg/L	MCL
EPAA C	80/11			6.600	µg/L	AMBIENT **
FERC C	84/05			1.000	µg/L	MCL
WHO C	84/01			10.000	µg/L	GV

DESCRIPTION: NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C₆H₆

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 µg/L

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27).
CYCLOHEXATRIENE (41).

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30).

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41).
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39).

ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80).

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

TOXICITY: RATING: 4 (VERY TOXIC).

ACUTE: IRRITATING TO MUCOUS MEMBRANES; SYMPTOMS INCLUDE RESTLESSNESS, CONVULSIONS, EXCITEMENT, DEPRESSION; DEATH MAY FOLLOW RESPIRATORY FAILURE.

CHRONIC: MAY CAUSE ANAEMIA AND LEUKAEMIA (45);
MUTAGENIC.

MODE OF ACTION: CHROMOABERRATION IN LYMPHOCYTE
CULTURES.

CARCINOGENICITY: A KNOWN HUMAN CARCINOGEN.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN
REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION,
PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA
SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT
EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES:

MOLECULAR WEIGHT: 78.12

MELTING POINT: 5.5°C (27).

BOILING POINT: 80.1°C (27).

SPECIFIC GRAVITY: 0.8790 AT 20°C (27).

VAPOUR PRESSURE: 100 MM AT 26.1°C (27).

HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41).

LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13
(39).

CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3
(41) SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

NOTES: EPA PRIORITY POLLUTANT.

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI), (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -when 'special pesticides' are requested three extra bottles must be filled
Cyanide	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label

-add 20 drops each nitric acid (HNO_3)
and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$)
(Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols

-250 mL glass bottle
-do not rinse bottle, preservative
has been added
-fill to top of label

**Radionuclides
(as scheduled)**

-4 L plastic jug
-do not rinse, carrier added
-fill to 5 cm from top

Organic Characterization (GC/MS - once per year)

-1 L amber glass bottle; instructions
as per organic
-250 mL glass bottle
-do not rinse bottle
-fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry

-500 mL plastic bottle (PET 500)
-rinse bottle and cap with sample
water three times
-fill to 2 cm from top

Metals

-500 mL plastic bottle (PET 500)
-rinse bottle and cap three times
-fill to 2 cm from top
-add 10 drops nitric acid (HNO_3)
(Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.

2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	<ul style="list-style-type: none"> -500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	<ul style="list-style-type: none"> -250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	<ul style="list-style-type: none"> -500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	<ul style="list-style-type: none"> -45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC) (OAPAHX)	<ul style="list-style-type: none"> -1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

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